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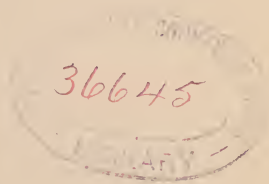
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PROCEEDINGS
OF THE
EIGHTH ANNUAL MEETING
OF THE
ASSOCIATION
OF
MILITARY SURGEONS
OF
THE UNITED STATES
HELD AT
KANSAS CITY, MISSOURI,
SEPT. 27, 28 AND 29,
1899.



COLUMBUS, OHIO :
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¹Col. N. Senn, Surgeon-General, I. N. G., was originally named Chairman of the Committee, but, having resigned, February 22, 1900, Lt. Col. Griffith was appointed Chairman in his stead.

Table of Contents.

Minutes of the Meeting	1
Address of the President	8
Reports of Officers and Committees	11
Volunteer Medical Officers in the Spanish-American War, Col. Charles H. Alden, Assistant Surgeon-General, U. S. Army.....	12
Bassini's Operation for the Radical Cure of Hernia, Medical Director Geo. Worth Woods, U. S. Navy	93
Management of a Field Hospital, Major Wm. H. Devine, Surgeon, M. V. M.....	97
Some Steps in the Organization and Instruction of the Medical De- partment of the Third Corps, U. S. V., Major John Van R. Hoff, Surgeon, U. S. Army	106
The Medical Department of the National Guard Its Own Quarter- master, Major Wm. M. Johnston, Surgeon, N. G., Pa.....	139
Remarks Upon the Gunshot Wounds of the Reduced Caliber in the Santiago Campaign, Major Louis A. La Garde, Surgeon, U. S. Army	141
Sterilization of Water for Troops in the Field, with Description of Ap- paratus, Major Walter Reed, Surgeon, U. S. Army	148
Echinococcus Hominis—A Remarkable Case of Echinococcus Mani- fested First in Chest-Wall and Subsequently in Osseous Tissue of Left Humerus, Medical Director George Worth Woods, U. S. Navy	157
Hospital Experience in the War With Spain, Lieutenant-Colonel Jefferson D. Griffith, Medical Director, N. G. Mo.....	161
Some Reminiscences of the Expedition to the Philippine Islands, Lieutenant-Colonel Henry Lippincott, Deputy Surgeon-General, U. S. Army	168
Flexion or Bent-Knee Marching, E. H. Bradford, M. D.....	175
First-Aid Package in Military Surgery, Colonel N. Senn, Surgeon- General, I. N. G.....	184

The Army Hospital Train During the Spanish-American War, Major Charles Richard, Surgeon U. S. Army	196
Poison Ivy and Its Kindred—with Remarks on Other Skin-Poisoning Plants, Major Valery Havard, Surgeon, U. S. Army	203
Some Observations on the Gauze Treatment of Suppuration of the Middle Ear, During and Since the Spanish War, Major Charles M. Robertson, Division Surgeon, U. S. V.....	212
Epithelioma of the Tongue and Left Superior Maxilla, Apparently Cured by Application of Formaldehyde, Locally and Interstitially, Medical Director George Worth Woods, U. S. Navy.....	216
The Canteen, Lieutenant Herbert A. Arnold, Assistant Surgeon, N. G., Pa.	218
Physical Standards of National Guardsmen, Brigadier General J. F. Calef, Surgeon-General, N. G., Conn.	226
My Conversion from Conservatism to Early Surgical Interference in Appendicitis, A Sketch, Major A. C. Girard, Surgeon, U. S. Army	230
Women Nurses in the American Army, Anita Newcomb McGee, Acting Assistant Surgeon U. S. Army	242
Wiring of Fractured Patella, Medical Director George Worth Woods, U. S. Navy	249
Conservatism in Military Surgery, Captain W. C. Borden, Assistant Surgeon, U. S. Army	250
Some Suggestions for the Organization and Interior Economy of a State Medical-Military Sub-Depot in War Time, Major John Van Rensselaer Hoff, Surgeon, U. S. Army	257
Some Observations of a Volunteer Medical Officer, Major F. W. Hendley, Surgeon, O. N. G.	272
One of the Lessons of the Spanish War, Major A. C. Girard, Surgeon, U. S. Army	276
A Short Account of the Yellow Fever Epidemic of 1897, and More Particularly Its Relations to the Garrisons of the Regular Army Stationed in the Regions Affected, Major W. C. Gorgas, Surgeon, U. S. Army	282
Practical Observations Upon Yellow Fever, or Black Vomit, Collected in the City of Vera Cruz, Lieut.-Cor. Z. R. Molina, C. M. M. M. ..	290

TABLE OF CONTENTS.

xi

Tentage for Tropical Service, Captain Edward L. Munson, Assistant Surgeon, U. S. Army	323
The Influence of the Climate of Whipple Barracks, Arizona, upon Pulmonary Tuberculosis as shown by Army Experience, Captain Alexander S. Porter, Assistant Surgeon, U. S. Army.....	327
Notes on Recent Progress in Military Surgery, Captain James E. Pilcher, Assistant Surgeon, U. S. Army	331
Constitution and By-Laws of the Association of Military Surgeons of the United States	334
Officers of the Association from Its Organization	339
Register of Members, Life Members	342
Active Members	343
Associate Members	359
Corresponding Members	360
Honorary Members	362
Deceased Members	363
List by States or Services.....	365

PROCEEDINGS
OF THE
EIGHTH MEETING
OF THE
Association of Military Surgeons
OF THE UNITED STATES,
HELD AT
Kansas City, Mo., Sept. 27, 28 and 29, 1899.

Minutes of the Meeting.

THE eighth meeting of the Association of Military Surgeons of the United States was held in Kansas City, Mo., September 27, 28 and 29, 1899. The following members were present during the meeting:

Lieut. H. A. Arnold, N. G., Pa.	Maj. R. R. Hunter, K. N. G.
Col. C. H. Alden, Asst. Surg.- Gen., U. S. A.	Maj. J. N. Jackson, N. G., Mo.
Lt.-Col. Chas. Adams, Asst. Surg.-Gen., I. N. G.	Capt. W. E. Jackson, Mo. V. I.
Maj. A. H. Briggs, N. G., N. Y.	Lt.-Col. Henry Lippincott, U. S. A.
	Col. Wm. McWatters, R. A. M. C.

- Lt.-Col. J. M. Barstow, Brig.-Surg., N. G., Iowa.
 Lt.-Col. Eduard Boeckmann, Asst. Surg.-Gen., N. G., Minn.
 Brig. Gen. Geo. Cook, Surg.-Gen. (Ret.), N. G., N. H.
 Maj. Thomas C. Clark, N. G., Minn.
 Lieut. George Coon, N. G., Minn.
 Maj. E. Arthur Carr, N. N. G.
 Brig. Gen. J. Francis Calef, Surg.-Gen., N. G., Conn.
 Maj. Wm. H. Daly, late U. S. V.
 Capt. F. E. Dillenbeck, K. N. G.
 Brig.-Gen. John B. Edwards, Surg.-Gen., W. N. G.
 Lt.-Col. B. E. Fryer, Dep. Surg.-Gen. (Ret.), U. S. A.
 Lt.-Col. J. D. Griffith, Med. Dir., N. G., Mo.
 Col. Wm. W. Grant, Surg.-Gen., N. G., Colo.
 Maj. E. H. Grannis, W. N. G.
 Maj. O. Grothan, N. V. I.
 Maj. A. C. Girard, U. S. A.
 Maj. G. H. Halberstadt, N. G., Pa.
 Lt.-Col. R. S. Huidekoper, late U. S. V.
 Maj. N. O. Harrelson, Mo. V. I.
 Maj. N. D. Harvey, R. I. M.
 Maj. George Halley, N. G., Mo.
 Col. Z. R. Molina, C. M. M. M.
 Col. H. M. W. Moore, O. N. G.
 Lieut. F. H. Martin, K. V. I.
 Maj. Wm. F. de Niedman, U. S. V.
 Maj. Chas. Richard, U. S. A.
 Maj. Chas. H. Robertson, N. G., Iowa.
 Col. N. Senn, Surg.-Gen., I. N. G.
 Maj. Enno Sander, N. G., Mo.
 Maj. W. F. Southard, M. V. M.
 Maj. W. S. Stewart, N. G., Pa.
 Maj. W. L. Smith, I. N. G.
 Maj. Andrew S. Stayer, N. G., Pa.
 Lieut. B. H. Stover, N. G., Iowa.
 A. A. G. Will T. Stark, N. G., Mo.
 Brig.-Gen. Alex. J. Stone, Surg.-Gen., N. G., Minn.
 Maj. John W. Trader, N. G., Mo.
 Maj. G. H. Torney, U. S. A.
 Maj. Jos. H. Townsend, N. G., Conn.
 Maj. Allen A. Wesley, I. N. G.
 Maj. M. B. Ward, U. S. V.
 Maj. Chas. E. Wilson, N. G., Mo.
 Capt. George W. Woods, Med. Dir., U. S. N.
 Maj. E. H. Whitcomb, N. G., Minn.

OPENING SESSION, CONVENTION HALL, WEDNESDAY,
SEPTEMBER 27.

The Association was called to order at 8:30 p. m. by Lt.-Col. William T. Stark, N. G., Mo., Secretary of the Committee of Arrangements.

Rev. W. C. Coleman, late Chaplain Fifth Missouri Infantry, U. S. V., invoked the Divine blessing.

Addresses of welcome were then delivered by Hon. James M. Jones, Mayor of Kansas City; Mr. Frank B. Walsh, of Kansas City, and Hon. L. C. Boyle on behalf of Kansas.

The Chairman introduced Captain George W. Woods, Medical Director, U. S. N., who, in the absence of Medical Director John C. Wise, represented the United States Navy.

CAPTAIN WOODS: As a representative of the naval branch of the public service, it gives me great satisfaction to hear the kind words of commendation for the work of the Navy during the Spanish-American War.

To Rear-Admiral W. K. Van Reypen, Surgeon-General, U. S. Navy, all praise is due for the war preparations which insured the success of the Navy Medical Department. In 1897, with remarkable prescience, he saw what was before us. Large quantities of stores were secured by his orders by Medical Director T. S. Walton, U. S. Navy, in charge of the Naval Laboratory, so that every medical and surgical need was supplied.

The Surgeon-General of the Navy exhibited at the International Medical Congress in Moscow a perfect model of an ambulance ship, which received the highest praise from the members of the Congress. When war broke out this model was fully realized in the hospital ship "Solace," which was purchased, fitted up and prepared for sea within three weeks. Her remodeling and preparation for hospital service was complete, including bedsteads, bedding, an operating room equal to that in the average hospital on shore, and ample stores and appliances. She was a seventeen knot ship and made numerous trips to Cuba and Porto Rico, bringing large numbers of sick and wounded North with great comfort and rapidity. Many necessary operations

were performed on board by, and under the supervision of, Surgeon Streets and Past Assistant Surgeons C. F. Stokes, G. Tucker Smith and E. Bogart. She was present at the battle of Santiago, rendered most valuable service in the rescue of the sick, wounded and burned from the wrecks of Cervera's fleet, and brought the majority of them to Norfolk and other northern ports, together with many of the wounded of the Army, to all of whom the most careful attention was accorded.

After this valuable service she was relegated to duty as transport, and is now plying between the Asiatic squadron and the Pacific coast, ready to resume her duty as an ambulance ship whenever the exigencies of the service demand it.

I thank you for your words of appreciation and warm welcome, and trust you may always be proud of your Navy in peace or war. You may always command your medical brethren of the naval service, whom I have the honor to represent at this meeting.

Dr. E. W. Schauffler of Kansas City extended the greetings of the medical profession of Missouri to the Association, and said:

The medical profession of Missouri extends to you its greeting and welcomes you to our city and state. I speak to you from the standpoint of your own fraternity, a profession that is more catholic than any on the face of the earth, and that has neither boundary nor limits, state or international.

The labors of the scientist in the laboratories of Berlin, Vienna or Japan belong alike to you and to me. The work of the practitioner, wherever he may be, belongs to the profession at large.

I represent to-night, not only the city practitioner with his divisions and sub-divisions of specialist, sub-specialist and super-specialist, but also the country practitioner who alone and unaided must meet every emergency of his profession.

On behalf of the ex-military surgeons of Missouri I also extend to you the hand of welcome. Could we muster them here to-night they would form no insignificant company; some marched from the Missouri to the City of Mexico in 1846; many more, some in Blue and some in Gray, did their duty like men during the long years of our Civil War, and many others have but

recently returned from the field or battle-ship, wearing the honored badge of your Association, with fresh laurels on their brows.

We are proud of the record of Missouri surgeons during the late war because they faithfully fulfilled important, although not brilliant, duties in caring for the health of their commands; instructing their men how to care for themselves; looking after the hygiene of the camps and contributing to the maintenance of physical and mental spirit and condition among the troops without which battles cannot be won.

The army and navy surgeon of to-day must be an expert in matters of hygiene, a climatologist, an executive officer, a business man and, above all, a diplomatist, that he may be able to persuade his commanding officer to permit him to do those things which he knows to be right and of which the commanding officer often knows nothing.

The Military Surgeon must do alone what we in our city organization accomplish by a board of health, a board of public works and twenty private charities beside. During the past two years the American people, through its medical military representatives, has done more to solve the problem of good health and hygiene and the possibility of living in a tropical climate than many other nations have done in as many decades.

Scientific hygiene has transformed in a short time the pest-holes of Cuba into habitable and salubrious abodes. To scientific hygiene and medicine is due the low death rate in our volunteer regiments in the Philippine Islands.

In your deliberations we trust that you will work not alone in time of peace to prepare for war, but that you will solve a better problem; namely, in time of war and in time of peace prepare for peace.

The Chairman then introduced Major William Warner, who spoke of the American Volunteer.

MAJOR WARNER: I esteem it a high privilege to speak, in this distinguished presence, of the American Volunteer, the citizen soldier, the sure reliance in peace and in war of a representative government. He represents the courage, intelligence and patriotism of the American people. His love of country and not his desire for fame impels him to fight her battles. While physi-

cal courage and power of endurance are necessary for the soldier, yet, unless these qualifications be guided by intelligence and inspired by patriotism, the soldier is but a fighting machine; but when so guided and inspired, the fighting machine thinks. The example of this moving, thinking, fighting machine, now and ever has been the American Volunteer.

The battles of the world that have contributed most to the political and religious liberties of the people have been fought on American soil by American volunteers. They have never been soldiers of fortune; their battles have been for the inalienable rights of man and they have conquered because their cause was just.

During the War of the Revolution and throughout the Civil War, the soldierly qualities of the American Volunteer were put to a crucial test upon hundreds of battlefields. His uncomplaining patience in privation, silent fortitude in suffering, superb manhood in defeat and unrivaled magnanimity in victory challenged, and will continue to challenge, the admiration of the civilized world.

For the true type of American Volunteer, however, we need not look back to the War of the Revolution nor to the Civil War. Last year our raw recruits, in the face of apparently insurmountable obstacles, stormed San Juan, scaled the heights of El Caney and marched triumphantly through Porto Rico. This year, on the plains and in the swamps of Luzon, eight thousand miles from home, they are fighting the battles of their country.

On land and sea the American Volunteers of '98 and '99 have demonstrated that they are as invincible in battle as were their fathers. To the brave soldiers who are fighting in the Philippines, the loyal heart of every stalwart American turns. That victory may perch upon their banners and that they may be given a safe return to loving homes and a grateful country, we pray the Patriot's God.

Colonel B. E. Fryer, Dep. Surg. Gen. (Ret.), U. S. A., Chairman of the Committee of Arrangements, made the following announcements for the meeting:

A year ago last May the Committee of Arrangements thought its work was almost accomplished, but on account of the

outbreak of war, the meeting of the Association had to be postponed. While in the field, however, the President and many of the members of the Association kept up their interest in this meeting, and on their return, the committees set to work and, as we believe, have prepared an excellent program for the meeting. The thanks of the committee are especially due to the President of the Association, Colonel Griffith, and to the Secretary of the Committee of Arrangements, Colonel Stark.

Our thanks are also due to the members of the Auxiliary Committee, and especially to Major Warner, Colonel Nelson, Doctor Street, Doctor Logan, Mr. Doggett and the Commercial Club of Kansas City.

On Thursday night, the President, Colonel Griffith, will throw his house open to the members of the Association and the ladies accompanying them.

On Friday night, Colonel Nelson will receive the members of the Association.

On Friday afternoon, tally-ho coaches will be ready at the Coates House to take the ladies to the Country Club, where they will be entertained.

The scientific meetings of the Association will be held at ten o'clock in the morning and two o'clock in the afternoon, beginning to-morrow morning.

The session closed with a benediction by the Reverend J. Stewart Smith.

SECOND SESSION, THURSDAY, SEPTEMBER 28.

The Association met at ten o'clock Thursday morning in the rooms of the Commercial Club of Kansas City, the President, Lieutenant-Colonel J. D. Griffith, N. G., Mo., in the chair. Major G. H. Halberstadt, N. G., Pa., was appointed Secretary pro tem.

The Chairman introduced Mr. Epperson, President of the Commercial Club of Kansas City, who welcomed the Association in the name of the club, in a few well-chosen remarks.

Upon motion of Colonel B. E. Fryer, the thanks of the Association were tendered to, and three hearty cheers given for, the Kansas City Commercial Club and its President, Mr. Epperson.

The President of the Association then delivered his annual address, Colonel C. H. Alden, Assistant Surgeon-General U. S. Army, being called to the chair.

THE PRESIDENT: Gentlemen of the Association of Military Surgeons of the United States; as President of the Association I bid you welcome to my home, Kansas City. This meeting of our Association should be the most important in its history.

Since we last met, our country has been involved in war with a foreign nation and has pursued it to a successful conclusion. The results of the war have been far reaching and have changed the map of the world, until to-day the sound of reveille is echoed around the world and the sun never sets on the dominion of the United States.

Many of the members of our Association were honored with important commissions during the war, and several sacrificed their lives on the altar of patriotism. It gives me much pleasure to reflect that the medical profession at least equals all other ranks of life in patriotism, loyalty and devotion to their country at a time when technical training was most needed.

Two years ago you honored me by electing me President of the Association. This honor, although undeserved, is and will ever be most highly appreciated by me. The time that has elapsed since our last meeting has been fraught with occurrences of tremendous moment. It has given opportunities for observation and experiment to our profession which will exert an influence whose importance cannot be measured. In the papers and discussions of this meeting, new theories and new laws may be promulgated which may revolutionize the time-honored maxims of military surgery.

The work of the military surgeon has been increased both in scope and in responsibility, and the late war has emphasized the vital importance of scientific medicine, not merely as an adjunct to, but almost as the very foundation of, successful warfare.

Under existing arrangements, three medical officers are assigned to each regiment in the field, one to each brigade and one

to each division. In my opinion, however, in the makeup of the division unit, at least three medical officers, a complete hospital corps and ambulance company should be left with each regiment in active service.

Disease, and particularly contagious and infectious disease, has killed more men than bullets. The military surgeon must, therefore, be a physician as well. The volunteer surgeons in the recent war were, as a rule, good diagnosticians and capable physicians. The mortality from typhoid fever would have been greatly decreased had we, as a nation, been on a war footing. The experience of the last year in this regard should serve as a lesson for the future, and it is to you we must look for the remedying of the defects in the administration of the medical department during the war.

The medical department should be separated entirely and completely from the quartermaster, commissary or any other department in our army and navy. Transportation of medical supplies should be under the control of the medical department. The sanitary inspectors of camps and bodies of troops should be individualized. Permanent camps should be established on sites approved by the Surgeon-General of the Army. The Medical Department should be represented in the National Cabinet. Every medical officer of the National Guard should be subjected to a rigid examination before he is admitted thereto. Every division should have a specialist assigned to it and every brigade, a dentist.

In conclusion, let me say that Kansas City belongs to you during your stay here. The homes of our people are open to you and wherever you may choose to go, rest assured that you will be welcome.

Upon motion of Major Daly a vote of thanks was tendered to the President for the instructive teachings enunciated in his address, and the address referred to the Publication Committee.

The President then read the following letter from Brigadier-General George M. Sternberg, Surgeon-General, U. S. Army:

WASHINGTON, September 21, 1899.

Colonel Jefferson D. Griffith, President, Association of Military Surgeons of the United States:

MY DEAR COLONEL—Will you kindly express to the members of the Military Surgeons' Association my regrets that I am unable to attend the meeting in Kansas City this year, and my sincere wishes that you may have a pleasant and profitable meeting. As you know, I am deeply interested in the success of the Association and regard it as a most valuable agency for the instruction of Medical Officers of the National Guard and of the regular service in their important duties. When war was declared against Spain and a large volunteer army called into the field, it became my duty to select the best men available for commissions as Brigade Surgeons and Chief Surgeons of Divisions and Army Corps, and I naturally made my selections, so far as was practicable, from among the members of the Military Surgeons' Association. Senn, Girard, Hoff and Maus were made Lieutenant-Colonels and Chief Surgeons of Army Corps. Forty-six of the Division and Brigade Surgeons appointed were members of the Military Surgeons' Association. This list includes the names of the present distinguished President of the Association and of many of its most active members.

I was very much disappointed that Congress did not give to Chief Surgeons of Army Corps and of Divisions, rank commensurate with the importance of the duties devolving upon them, and corresponding with that of other Staff Corps. I had recommended that Chief Surgeons of Army Corps should have the rank of Colonel, and of Divisions, that of Lieutenant-Colonel, and the bill providing for a Volunteer Army, as it passed the House, gave them this rank. Unfortunately, this was changed in the Senate, and the bill as finally passed, gave Regimental, Brigade and Division Surgeons the same rank—that of Major.

Without doubt, experience in the National Guard and the papers and discussions relating to the duties of Military Surgeons, which have occupied the attention of the members of this Association, did much in the way of preparing the medical officers called into service for their responsible duties. But all will be ready to admit that they still had much to learn, especially with refer-

ence to camp sanitation and medical administration. We had plenty of good surgeons, but a skilful surgeon is not necessarily a good Chief Surgeon of an Army Corps, Division or Brigade. Executive ability, untiring energy and special knowledge with reference to camp sanitation and army methods of administration are even more important than medical knowledge or surgical skill for the Chief Surgeon of a Brigade, Division or Army Corps, and I urge upon the members of the Association of Military Surgeons of the United States the importance of giving special attention to these matters. Very sincerely yours,

(Signed) GEO. M. STERNBERG,
Surgeon-General, U. S. Army.

Telegrams of regret were then read from Col. R. Harvey Reed, Surgeon-General, Wyo., and Col. R. Emmett Griffin, Surgeon-General, Neb.

Upon motion, the President appointed Colonel W. W. Grant, N. G., Colo.; Major T. C. Clark, N. G., Minn., and Major C. Richard, U. S. Army, as Committee of Audit, with instructions to report as early as possible.

Upon motion, the roll of the registered members of the Association was called.

The minutes of the last meeting were approved without being read.

Upon motion, the report of the Secretary was read by Major G. H. Halberstadt, N. G., Pa., Secretary pro tem., and the report accepted and referred to the proper committees; namely, the Executive Committee, the Committee of Finance, the Committee of Audit, and the Nominating Committee.

Upon motion of Brigadier-General George Cook, N. G., N. H., the delegates from foreign countries, Colonel William McWatters, R. A. M. C., and Colonel Zacarias R. Molina, C. M. M., and the visiting delegates were introduced to the Association.

The report of the Treasurer was then called for.

Upon motion of Major Wm. H. Daly, late U. S. V., the Committee of Audit was instructed to make suggestions as to the

remission of dues for 1898 in accordance with the condition of the treasury.

Upon motion, the Executive Committee was instructed to report at the afternoon session.

Upon motion, the report of the Committee on Necrology was referred to the Publication Committee and the committee granted further time.

Upon motion, the Nominating Committee was requested to assemble at the close of the morning session, its report to be the first order of business in the afternoon session.

Upon motion, the Association adjourned until 1:30 p. m.

AFTERNOON SESSION.

The Association convened at 1:30 p. m.

The report of the Committee on Audit was read and accepted and the committee discharged.

A paper entitled, "Volunteer Medical Officers in the Spanish-American War," was then read by Colonel C. H. Alden, Assistant Surgeon-General, U. S. A.

Upon motion, the thanks of the Association were extended to Colonel Alden, and the paper referred to the Publication Committee.

DISCUSSION.

MAJOR WM. H. DALY: I believe it will be found to be the sense of this meeting that the names of the Acting Assistant Surgeons appear on the roll of honor. During my service in the Spanish-American War, in which I served over a very extensive area, I met many Acting Assistant Surgeons of high professional, and good administrative and executive ability, and I think it is due to them on behalf of this Association and of the government, that their names should be published and this recognition accorded them as a matter of justice.

COLONEL C. H. ALDEN: If desired by the Association I shall be very glad to compile a list of the Acting Assistant Surgeons. It was not my intention to neglect their claims, but the

names were so numerous that I was afraid it would be impracticable to publish the list in the Transactions. The list can be preserved in the records of the Association for reference, and I shall forward it to the Secretary.

Upon motion of Major Daly, it was decided that the names of the Acting Assistant Surgeons who served in the Spanish-American War be added to the list of medical officers to be published in the Transactions.

The report of the Executive Committee was then received and upon motion, referred to the Publication Committee.

Captain George Worth Woods, Medical Director, U. S. N., read a paper entitled, "Bassini's Operation for the Radical Cure of Hernia; Seven Successful Operations," which, upon motion, was referred to the Publication Committee.

Major T. C. Clark, N. G., Minn., presented an amendment to Section 2, Article II, of the Constitution, said amendment being the addition and insertion of the words "medical officers of the Union Volunteer Service." The resolution, with the amendment, was laid over until the next meeting of the Association.

Brigadier-General J. Francis Calef, Surgeon-General, N. G., Conn., read a paper entitled, "Physical Standards of National Guardsmen," which, upon motion, was referred to the Publication Committee.

Papers by Lieutenant-Colonel W. H. Devine, M. V. M., on the "Management of a Field Hospital," and by Major John VanR. Hoff, U. S. Army, on "Some Steps in the Organization of the Medical Department of the Third Army Corps, U. S. V.," were read by title and referred to the Publication Committee.

Major William M. Johnson, late Surgeon, U. S. V., read a paper entitled, "The Medical Department Its Own Quartermaster," which, upon motion, was referred to the Committee on Publication.

The room was now darkened and stereopticon pictures thrown upon a large screen. Lieutenant-Colonel Henry Lippincott, U. S. Army, explained the illustrations of military hospitals; Major George H. Torney, U. S. A., Surgeon in charge of the hos-

pital ship "Relief," described each picture of that ship as it was thrown on the screen, the temporary hospitals at Siboney, Santiago, and Porto Rico, views of the temporary hospitals at San Juan, Columbia Hospital, and other scenes at Havana, and Colonel Charles H. Alden, Assistant Surgeon-General, U. S. A., explained the views of temporary army hospitals in this country, the hospital ship "Missouri," and a series of X-Ray photographs showing bullets lodged in the bodies of soldiers who were cared for on the hospital ship "Relief." Lieutenant-Colonel J. D. Griffith, N. G., Mo., explained the illustrations of army hospitals at Chickamauga and elsewhere, and also the photographs showing the effects of Mauser bullets.

The Association then adjourned.

MORNING SESSION, FRIDAY, SEPTEMBER 29.

The meeting was called to order by the President.

The Secretary of the Committee of Arrangements made the following announcements:

Carriages will leave the Coates House this evening for Colonel Nelson's residence in Hyde Park.

Carriages will also be in waiting at two o'clock this afternoon to take the visiting ladies to the Country Club, or wherever they may wish to go.

Invitations are extended by Swift & Co. and Armour & Co., to the members of the Association and their friends to visit their packing houses, and cards will be found on the Secretary's table.

Upon motion, the reading of the minutes of the previous day's sessions was dispensed with.

By unanimous vote of the Association, Colonel Zacarias R. Molina, C. M. M. M., was requested to read his paper entitled, "Practical Observations Upon Yellow Fever or Black Vomit, Collected in the City of Vera Cruz."

Colonel Molina then read his paper, which, upon motion, was referred to the Publication Committee.

Captain George Worth Woods, Medical Director, U. S. Navy, read a paper entitled, "A Remarkable Case of Echino-

coccus Hominis," which, upon motion, was referred to the Publication Committee.

Papers entitled, "Some Recent Military Surgical Literature," by Captain James E. Pilcher, Assistant Surgeon, U. S. Army; "A Study of the Gait of the Soldier," by Dr. E. H. Bradford of Boston; and "Some Observations on the Santiago Campaign," by Major Louis A. La Garde, Surgeon, U. S. Army, were read by title and, on motion, referred to the Publication Committee.

The President then introduced the founder of the Association, Colonel Nicholas Senn, Surgeon-General, I. N. G., who read a paper entitled, "First-Aid Dressings in Military Surgery," which, upon motion, was referred to the Publication Committee.

It was announced by the Chairman that, at the close of the session, the official photograph of the Association would be taken and all members were requested to be present.

The discussion of Colonel Senn's paper was deferred until the afternoon session.

Lieutenant-Colonel Rush S. Huidekoper, late U. S. V., read a paper entitled, "The Organization of the First Army Corps," which was discussed by several of the gentlemen present and referred to the Publication Committee.

The Association then adjourned until 2 p. m.

AFTERNOON SESSION.

The Association was called to order by the President at 2 p. m.

The report of the Nominating Committee was read. It was moved and seconded that the report of the Committee be adopted. When the motion was stated and remarks called for, Colonel W. W. Grant said:

I desire to substitute Washington for New York in this report. It is well known to most of the medical men of this country that any National association which holds its meeting in the city or state of New York receives very little support from the physicians and surgeons of New York. I am informed that at the

Convention of this Association held in Buffalo only three New York surgeons were present. It should be remembered that next year Washington will be a city of unusual interest and attraction for the people of this country, and especially for medical men; as the Congress of Physicians and Surgeons assembles there, and as the American Medical Association meets at Atlantic City.

MAJOR A. H. BRIGGS: I invite this Association to meet in New York because I believe it is for the best interests of the Association. New York is the center of the greatest population of this country. New York and the adjacent states have large and active National Guard organizations. I can guarantee that if you come to the Empire State you will be cordially received. The Governor of our state is a soldier whose influence is not bounded by the limits of the State of New York. When Governor Roosevelt has been introduced to the Association, it will have a firm friend who will see to it that its interests are cared for in the future. I believe that it is for the interest of the Association to meet next year in New York City, where I know you will be hospitably received and entertained.

LIEUTENANT-COLONEL B. E. FRYER: Flattering inducements have been offered by New York; should the Association go to Washington, we will have there the Army Medical Museum and the home of the President.

MAJOR T. C. CLARK: I do not think the Association should go to New York. In that city a great deal of entertaining is done and it would be difficult to arouse enthusiasm if we go there as a scientific body.

A vote was then taken, and New York selected as the next place of meeting.

The Secretary was authorized to cast the unanimous ballot of the Association for the officers named in the report of the Nominating Committee.

The Chairman then announced that the discussion of Colonel Senn's paper would be in order.

COLONEL W. W. GRANT: Colonel Senn's paper is one of the most suggestive, instructive and valuable which this Associa-

tion has ever heard. About ten years ago I made suggestions in reference to an emergency pack, in which I discussed some of the needs mentioned by Colonel Senn as appropriate for every officer and soldier in the Army. While in Vienna in 1888 I ascertained that, although the Austrian officers each had an emergency outfit, the Austrian soldier was not so provided.

The package which has been suggested by Colonel Senn is, it seems to me, one of the most simple and valuable which could be adopted by the National Guard or the Army.

Colonel Senn has told me that he believed aluminum would be the best covering for his first-aid package. Experience has not been sufficiently large to determine the exact value of the package in the hands of the soldier himself; but I think that under the intelligent instruction which the surgeon is expected to give to both officers and men, any soldier can use this emergency package on the battlefield and thereby often prevent infection.

COLONEL C. H. ALDEN: I wish to express my appreciation of the work of Colonel Senn in this regard. The Surgeon-General has been so fully impressed with the importance of this matter, that he has given a large order for these packages to be put up under Colonel Senn's directions. I am sure that the service and the Surgeon-General are deeply indebted to Colonel Senn for taking this matter up.

Colonel B. E. Fryer, Dr. W. P. King of Kansas City, and Major Wm. H. Daly also discussed the paper.

COLONEL N. SENN: I have a little surprise for the Association and wish to call your attention to it now if I may have the privilege. I have felt for a long time that we, as an organization, should attempt to secure medical literature of the highest type pertaining to the maintenance of the Army, Navy and National Guard.

A charter member of this Society who is always present at these meetings and whose name is known all over the United States, Major Enno Sander of St. Louis, has requested me to state to the Association that he will donate annually a prize of \$100, to be known as the Enno Sander prize.

Upon motion of Colonel Senn, the thanks of the Association were tendered to Major Sander for his munificent gift, and the Chairman appointed as committee to examine papers for this prize, Colonel N. Senn, Surgeon-General, I. N. G.; Major A. C. Girard, Surgeon, U. S. Army, and Captain George Worth Woods, Medical Director, U. S. Navy.¹

The Chairman then introduced the delegate from Great Britain, Colonel William McWatters, R. A. M. C.

COLONEL MCWATTERS: I thank you very much indeed for your kind invitation to Her Majesty's Government, and am very happy that I was selected as delegate to attend this convention. I assure you that I have been most hospitably received, have been very much instructed and shall go away with most pleasant memories of your courtesy and hospitality.

The Chairman of the Committee of Transportation then read and filed his report.

Major Charles Richard, U. S. Army, read a paper entitled, "The Army Hospital Train," which was referred to the Publication Committee.

The President read a paper entitled, "Some Further Effects of Bullets from Modern Rifles and Pistols," which was referred to the Publication Committee.

A paper entitled, "Some of the Difficulties of a Volunteer Medical Officer when First Mustered Into the United States Service," by Major Charles C. Foster, Surgeon, Fifth Massachusetts Volunteers, was read by title and, upon motion, referred to the Publication Committee.

Major A. C. Girard, U. S. Army, read by title papers entitled, "My Conversion from Conservatism in the Treatment of Appendicitis." and "One of the Lessons of the Spanish War," which were referred to the Publication Committee.

Upon motion of Major Girard, a committee was appointed in accordance with the suggestions of the latter paper, consisting

¹ Upon request of Colonel Senn, Lt.-Col. J. D. Griffith, N. G., Mo., was subsequently appointed Chairman of the Committee, in his place.

of Major Walter Reed, U. S. Army; Colonel C. H. Alden, U. S. Army, and Colonel N. Senn, I. N. G.

Lieutenant-Colonel Henry Lippincott, U. S. Army, read a paper entitled, "Some Reminiscences of the Expedition to the Philippine Islands," which, upon motion, was referred to the Publication Committee.

Major Charles M. Robertson, N. G., Iowa, read a paper entitled, "Some Observations on Suppurative Inflammation of the Middle Ear During and Since the Spanish-American War," which, upon motion, was referred to the Publication Committee.

Major John W. Trader, N. G., Mo., read a paper on "Military Surgery, Past and Present," which, upon motion, was referred to the Publication Committee.

Captain George Worth Woods, Medical Director, U. S. Navy, read by title a paper on "Epithelioma of the Tongue and Left Superior Maxilla, Apparently Cured by Application of Formaldehyde, Locally and Interstitially," which was referred to the Publication Committee.

Major T. C. Clark, N. G., Minn., presented for the committee the resolutions laid over from the last meeting.

Upon motion, the following amendments to the Constitution were adopted:

Article III, Section 2, to read "The Publication Committee shall consist of three members, one of whom shall be the Secretary ex-officio and Chairman."

Article V, Section 5, by omitting the section which prescribes the duties of the Editor.

Article VI, Section 2, prescribing the duties of the Publication Committee.

Article II, Section 2, by inserting the words "Extending active membership to the officers of the United States Marine Hospital Service."

Article VI, Section 4, by substituting the words "Navy and United States Marine Hospital Service" for the words "and Navy."

The suggestion of the Secretary that membership in the Associations be open to Acting Assistant Surgeons of the U. S. Army and Navy was laid over until the next meeting.

The Executive Committee made its report of the elections to membership up to and including September 28, 1899. The report was adopted and filed.

Colonel Alden, Asst. Surg.-Gen., U. S. Army, prefacing nominations for Honorary Membership, said:

"I am sure that I simply voice the sentiment of this Association—in fact, I have been so assured by many members—that this meeting, the first after the close of the Spanish-American War, ought not to pass without a recognition on our part of the patriotic and devoted work of woman in that war. We cannot forget how, when the epidemic of typhoid fever overtaxed the hastily levied and therefore mostly untrained Hospital Corps, the trained female nurses came to our relief and rendered most valuable and indispensable service. Neither can we forget the generous and devoted women who contributed in various ways, suggested by their thoughtful tact, to the welfare of the sick and wounded both by money and personal service in hospital and on the field.

"The selection of trained nurses by the Daughters of the American Revolution Hospital Corps was a notable instance. The provision made by others for the comfort of the nurses while awaiting orders; the contributions of useful appliances for the hospital ships 'Relief' and 'Missouri'; the generous donation of considerable sums to be expended by the Surgeon-General and Medical Officers for the benefit of the sick and wounded are also instances.

"It is with great pleasure, therefore, that the following names of women—representatives, I may say, of various agencies engaged in this patriotic work—are nominated for election to honorary membership in this Association":

Miss Clara Barton, President of the American Red Cross Association, Glen Echo, Md.

Miss Helen Gould, Irvington-on-Hudson, New York.

Dr. Anita Newcomb McGee, late Director of the Daughters of the American Revolution, Washington, D. C.

Mrs. John F. Merrill, President of the Red Cross Society of San Francisco, Cal.

Mrs. Ellen Hardin Walworth, President of the Woman's National War Relief Association, 251 W. 88th. St., New York, N. Y.

The nominations were seconded by Col. N. Senn of Illinois, and the nominees elected by unanimous vote of the Association.

Upon recommendation of the Executive Committee, the following were elected Corresponding Members of the Association:

Dr. Karl Rudberg, Staff Surgeon, Swedish Navy.

Colonel Zacarias R. Molina, Cuerpo Médico Militar Mexicano.

Colonel William McWatters, Royal Army Medical Corps.

Dr. Tomat Suri, Lieutenant-Commander, Japanese Navy.

Surgeon Lt.-Col. Fred W. Borden, Minister of Militia and Defence for Canada.

W. Mitchell Banks, M. D., F. R. C. S.

Major A. H. Briggs, N. G., N. Y., offered the following resolutions which were adopted:

WHEREAS, For more than two years, the duties of the Secretary of this Association have been most ably performed by Captain James E. Pilcher, U. S. Army, the work entailing a vast amount of labor and time; and,

WHEREAS, Owing to poor health, Captain Pilcher is unable to be with us or longer continue his work in the Association, therefore, be it

Resolved, That we extend to him our grateful thanks for his efficient and untiring labor while acting as Secretary of the Association and Editor of its Transactions, and, that we most earnestly hope and pray that he may soon be restored to perfect health. And further be it

Resolved, That a copy of this preamble and resolutions be sent to Captain Pilcher as an expression of our appreciation and sympathy.

Major T. C. Clark, N. G., Minn., offered the following resolutions which, upon motion, were adopted:

Resolved, That a special committee of five be appointed on securing state and national legislation for the purpose of securing

uniformity of organization and equipment of the medical departments of the several states, with that of the United States Army.

Resolved, That the thanks of this Association be extended to the Chamber of Commerce of Kansas City for the use of its beautiful rooms during the meetings of the Association, to President Epperson for his cordial welcome, and to Secretary Clendenning for his untiring services on behalf of the Association.

Resolved, That the thanks of this Association be extended to the Coates House for the free use of its rooms for the preliminary meeting of the Association.

Resolved, That the thanks of this Association be extended to the newspapers of Kansas City for the liberal use of their columns in the interest of the Association, and especially to Colonel W. R. Nelson, not only for the above services, but also for his hospitable entertainment of the Association.

Resolved, That the thanks of this Association be extended to the Local Committee of Arrangements, especially recognizing the untiring efforts of the Chairman, Lieutenant-Colonel Blencowe E. Fryer, U. S. Army, retired, and the Secretary, Lieutenant-Colonel William T. Stark, for the success of this meeting and the welfare of the members.

Resolved, That the thanks of this Association be extended to the medical profession and the citizens of Kansas City for their most hospitable reception and treatment.

Resolved, That the congratulations of this Association be extended to our Honorable Ex-President, Brigadier-General George M. Sternberg, Surgeon-General, U. S. Army, for his services in the late war with Spain, and that we gratefully acknowledge his loyalty to this Association and his many liberal recognitions of our membership as shown in his appointments to the Medical Department of the United States Volunteer Service.

Resolved, That the thanks of this Association be tendered to our retiring President, Lieutenant-Colonel Jefferson D. Griffith, N. G., Mo., for his enthusiastic and self-sacrificing labors on behalf of the success of this eighth meeting of the Association of Military Surgeons of the United States, and for the hospitality extended to the Association by his charming wife and himself in their beautiful home.

The retiring President then said:

GENTLEMEN OF THE ASSOCIATION: Allow me as retiring presiding officer of your body, to thank you for the courtesy with which you have treated me. I have tried to do my duty, but do

not know whether I have at all times come up to the full requirements. However, I am satisfied that in the gentleman whom you have elected your President, and whom I now have the pleasure of presenting to you, you will have one who will.

COLONEL C. H. ALDEN, President-elect: Gentlemen—I only hope that I shall do as well as Colonel Griffith. Words hardly express my feelings for the honor you have given me on this occasion. It is an honor that is especially grateful to me. From the first organization of the Association I have taken an interest in it and have been convinced of the importance of the work and of the great good it will accomplish for the Army and the Nation. I do not feel that it is simply an honor you have given to me, but that you have given me work to do, and I must rely on the members of the Association and the officers-elect for their cordial help.

I feel that there is a great future for the Association; the Army is being increased and the Association will increase in strength and influence. In the new legislation that is being enacted we must make our influence felt. I feel that the time between this and our next meeting is of great importance, and I pledge you my best efforts for the success of the Association.

Upon motion, the remaining papers not read and not called for were referred to the Publication Committee.

The Executive Committee was then appointed.

There being no further business before the Association, upon motion of Major A. H. Briggs, the Association adjourned without day.

Reports of Officers and Committees.

I. REPORT OF THE TREASURER.

(See report of Auditing Committee.)

II. REPORT OF THE SECRETARY AND EDITOR.

THE Secretary and Editor has the honor to report that the work of his office is complete and up to date, although he regrets that failure in health will prevent his attendance at the eighth annual meeting. During the fiscal years 1897-1898, he was so situated that he was able to give the Association work ample time for its accomplishment, and most of the present report refers to the work of that year, the Spanish war having caused an almost entire cessation of the Association work during the year 1898-1899.

Minutes of the Meeting.—The first duty of the Secretary consisted in the preparation of the minutes of the seventh annual meeting. Several new features were introduced here as contributing to the usefulness of this part of the work:

(1) The introduction, just prior to the first day's proceedings, of a complete list of the members in attendance upon the meeting.

(2) The preparation of a complete summary of each session's proceedings at the head of the minutes of each session.

(3) The insertion of a reference to the number of the page in the volume upon which may be found each contribution referred to.

(4) The removal of the discussions of the papers from the minutes and their attachment to the papers or groups or papers to which they refer; the addition to the report of the stenographer, of much information which he did not obtain, by means of which

the minutes were made as nearly absolutely a complete picture of the meeting as possible.

Preparation and Completion of Reports of Committees.—The Secretary regrets greatly that he was unable to obtain for publication the reports of his friend and predecessor, Major Burgin, to whom he applied for them both in person and by letter. In case of the Executive Committee, of which he had been a member as Assistant Secretary, however, he was able to collect the material into a report, the publication of which was ordered by the Chairman. He was able also to add to the necrological report the sketches of four members whose deaths had not been known to the committee.

List of Officers and Committees.—Believing it important for the work of the members that all should be promptly informed of the names and addresses of the new officers and of the composition and purposes of the new committees, a circular embodying this information was prepared and issued immediately after the close of the meeting.

Roll of Members.—The completion, correction and uniform arrangement of the lists of members was a task which early demanded the attention of the Secretary. The plan adopted was a continuation and extension of that employed in the lists of active and associate members in the Transactions for the preceding year. There was added to the information previously given, however, the year in which each member joined the Association and a statement of the official positions in the Association which each member had held.

Deceased Members.—The names of deceased members were removed from the other lists and grouped in a class by themselves, thus avoiding for the future the hitherto frequent mistake of confusing them with the living.

Corresponding Members.—The list of corresponding members was found to be so incorrect and incomplete that an entire rearrangement was found to be necessary. Several names were found to be incorrectly spelled, many official positions were incorrectly stated, and several of the officers were dead. Through the courtesy of the Bureau of Military Intelligence of the War

Department, and of the Surgeon-General of the Army, it was possible to obtain much of the information needed to correct the list, which was then arranged upon a plan uniform with the active and associate lists and put into its present shape.

Honorary Members.—Similar work was done in connection with the list of honorary members, several omitted names being supplied, some titles corrected, and the whole arranged in a uniform manner.

Roll of Members by States and Services.—The frequently expressed need for a roll showing the membership by states and services suggested the preparation of such a list, which has become one of the most useful features of the Association records, and which should in the future be always kept up to date.

Resignations from Membership.—There were fifteen resignations from membership during the year, as follows:

Capt. S. C. Ayres, U. S. V.	Lieut. G. G. Harman, N. G., Pa.
Lieut. J. W. Barker, U. S. A.	Major M. D. Hoge, Jr., Va.
Major P. R. Brown, U. S. A.	Capt. J. J. Lemon, N. G., Miss.
Gen. H. L. Burrell, M. V. M.	Major G. F. Lydston, N. G., Ill.
Major C. Buttner, N. G., N. J.	Gen. J. D. McGill, N. G., N. J.
Major L. C. Carr, O. N. G.	Major C. H. Rice, M. V. M.
Major C. Ewen, U. S. A.	Col. F. L. Town, U. S. A.
Capt. J. J. Willard, N. G., Colo.	

Memberships Terminated by Non-Payment of Dues.—A considerable number of members were reported by the Treasurer as delinquent for more than two years, a fact which, under the constitution, required them to be dropped from the roll. They had been duly notified by the Treasurer, but the Secretary also wrote each one of them a personal letter urging him to re-establish his membership. Several prompt replies were received, but the following twenty-two still remained in arrears and their membership was therefore constitutionally terminated:

Major A. H. Appel, U. S. A.	Capt. J. W. Harriman, N. G., Ia.
Lt. F. E. Baldridge, N. G., Ala.	Major G. W. Hogg, N. G., N. H.
Capt. J. M. Cabell, U. S. A.	Lt. F. S. Hudson, N. G. S. N. Y.
Capt. C. H. Carey, N. G., Wis.	Lt. W. Jacoby, N. G., Minn.
Major F. S. Crego, N. G. S. N. Y.	Capt. J. M. O'Neal, O. N. G.

Dr. W. H. Fisher, U. S. M. H. S. Lt. C. R. Parke, N. G., Pa.
 Lt. T. Fitzpatrick, K. N. G. Lt. J. Pinquard, N. G., Tex.
 Lt. A. Forin, N. G., Minn. Capt. J. D. Westervelt, N. G.,
 Major J. T. Fryar, N. G., Tenn. Tex.
 Lt. F. L. Fuchs, N. G. S. N. Y. Lt. R. A. Wheaton, N. G., Minn.
 Gen. J. A. Gottlieb, N. Y. Major C. C. Wiley, N. G., Pa.
 Lt. C. O. Green, N. G. S. N. Y.

Memberships Terminated by Death.—Death has robbed us of eleven of our members, as follows:

Surg.-Gen. N. L. Bates, U. S. N.
 Major J. H. Etheridge, I. N. G.
 Major E. C. Farquhar, O. N. G.
 Ex-Supervising Surg.-Gen. J. B. Hamilton, U. S. M. H. S.
 Surg. W. H. H. Hutton, U. S. M. H. S.
 Major H. McElderry, U. S. A.
 Brig. Gen. A. Ordway, N. G., D. C.
 Major G. H. Rohé, N. G., Md.
 Major L. S. Smith, N. G., Pa.
 Surg. Lt.-Col. F. W. Strange, M. R. C. S.
 Surg. Maj.-Gen. Sir W. A. Mackinnon, F. R. C. S.

These losses brought our membership from 444, the strength at the last meeting, down to 385.

Efforts to Increase Membership.—Recognizing that increase in membership means increase in effectiveness and usefulness, and desirous of maintaining the numerical strength of the Association, the Secretary has taken advantage of every opportunity to add new members to the Association. In the development of this idea, he prepared a superbly illustrated and splendidly printed circular setting forth the advantages of the Association. A copy of this circular, with an addressed return envelope, a blank application for membership, and a personal letter inviting him to avail himself of the opportunities afforded by the Association, was sent to every active medical officer of the National Guard in the United States, whose name was not already upon our rolls. The response to this was large and would have been still more general, had not the war cloud arisen to make the future uncertain. The Secretary was also the means of inducing a considerable number of his own corps to join the Association.

A number of former members applied for reinstatement, and upon payment of all back dues, their names were duly placed upon the roll.

The new and reinstated members were sixty-five in number, as follows :

(Elected November 25, 1897.)

Major C. S. Austin, N. G., Mo.	General J. N. Jenne, N. G., Vt.
Major J. Brooke, U. S. A.	Major Henry McElderry, U.
Captain J. T. Clarke, U. S. A.	S. A.
Lieut. W. D. Fales, N. G., D.	Captain C. Pesold, N. G., Mo.
C.	Major B. F. Pope, U. S. A.
Lieut. C. E. B. Flagg, U. S. A.	Lieut. A. S. Porter, U. S. A.
Captain E. B. Frick, U. S. A.	Captain C. E. Wilson, N. G.,
Lieut.-Col. B. E. Fryer, U. S.	Mo.
A.	Lieut. J. S. Wilson, U. S. A.
Lieut. H. M. Hallock, U. S. A.	

(Elected February, 1899, membership to date back to date of application.)

Major A. W. Allen, N. G.,	Lieut. F. M. Kemp, U. S. A.
Minn.	Major F. D. Kendall, S. C. V.
Major F. C. Armstrong, N. G.,	T.
Kan.	Lieut. R. J. Kingston, N. G. S.
Major F. E. Artaud, N. G., La.	N. Y.
Captain R. Barney, Jr., N. G.,	Lieut. F. S. Ledeboer, N. G.,
Mo.	S. N. Dak.
Asst. Surg. F. L. Benton, U.	Capt. W. F. Lippitt, U. S. A.
S. N.	Major T. C. McCord, Ill. V. I.
P. A. Surg. R. G. Broderick,	Colonel W. J. Maybury, N. G.,
U. S. N.	Me.
Major C. E. Bruce, N. G. S.	Captain L. C. Morris, N. G.,
N. Y.	Ala.
Lieut. A. F. Brugman, N. G.	Captain W. H. E. Morse, N.
S. N. Y.	G., Ia.
Major W. Cogswell, M. V. M.	Major S. D. Powell, N. G. S.
Lieut. A. F. Czibulka, I. N. G.	N. Y.
Captain H. P. de Forest, N. G.	Colonel R. H. Reed, N. G.,
S. N. Y.	Wyo.

Lieut. A. G. Dougherty, N. G., N. J.	Asst. Surg. T. L. Rhoads, U. S. N.
P. A. Surg. A. Farenholt, U. S. N.	Lieut. T. E. Roberts, I. N. G.
Major C. Gilham, N. G., W. Va.	Lieut. S. C. Stanton, I. N. G.
Asst. Surg. A. G. Grunwell, U. S. N.	Lieut. J. C. Stedman, M. V. M.
Major J. C. Hammond, N. G., Mont.	Lieut. E. L. Stewart, F. S. T.
Board of Officers, 65th. Regt., N. G. S. N. Y.	Major A. L. Wright, N. G., Ia.
	Colonel W. Wylie, N. G., Ariz.
	Major A. K. A. Liebich, 5th Inf., O. N. G.

(Elected September 26, 1899, membership to date back to date of application.)

Major W. H. Daly, U. S. V.	Major C. Richard, U. S. A.
Colonel W. W. Grant, N. G., Colo.	Colonel J. V. Shoemaker, N. G., Pa.
Major N. O. Harrelson, N. G., Mo.	Asst. Surg. R. K. Smith, U. S. N.
Lieut.-Col. R. S. Huidekoper, U. S. V.	Major A. G. Thomson, Pa. V. I.
Lieut. C. W. Jackson, N. G., S. N. Y.	Major M. B. Ward, U. S. V.
Lieut. G. H. Jones, O. V. I.	P. A. Surg. G. B. Wilson, U. S. N.
Lieut.-Col. O. H. Marion, M. V. M.	Lieut. J. W. Wright, N. G., Pa.

Numerical Strength of the Association.—At the close of the seventh annual meeting, the effective strength—active and associate combined—of the Association, was 444; it is now 455; from which it will be seen that *the Association has reached its numerical high-water mark.* The increase during the year is 14 per cent., a phenomenal growth, particularly when it is remembered the increase in the membership of an association habitually occurs at the annual meetings, and not in the intervals between them.

Preservation of Original Applications for Membership.—The value of the original applications for membership dictating a more efficient method of preservation and a more ready method of consultation than that offered by bunching with rubber bands, all the

applications made prior to the seventh annual meeting were alphabetically arranged and bound in a serviceable volume. Those received since that time have been similarly bound into a second volume.

Manual of the Association.—The corrected lists of officers, committees and members, together with the revised constitution and by-laws, were grouped into a single pamphlet and published as the Manual of the Association. There was a considerable demand for these pamphlets and I am strongly in favor of issuing them annually in future, adding to them, however, a sketch of the Association and its work.

Acting Assistant or Contract Surgeons.—In connection with the question of membership, the attention of the Association is invited to the fact that the position of acting assistant or contract surgeon has been revived both in the army and the navy. It has been legally decided that these gentlemen are not commissioned officers, for which reason they are not eligible to membership in the Association of Military Surgeons. They are, however, military medical officers and by their training and professional acquirements, are eminently qualified to participate in our work. It is proposed then that Section 2, Article II of the Constitution be amended to read: "Commissioned medical officers and acting assistant or contract surgeons of the United States Army," etc.

Amendments to the Constitution and By-Laws.—Attention is invited to the following amendments to the Constitution and By-laws, proposed at the last meeting and laid over under the Constitution for consideration at this one:

1. Amend Article III of the Constitution by omitting the Editor from the list of officers, so that Section 1 shall read: "The officers shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold," etc.

2. Amend Article III, Section 2 of the Constitution to read: "A Publication Committee, to consist of three members, one of whom shall be the Secretary as *ex officio* Chairman."

3. Amend Article III, By-laws, to read: "At the annual meeting the President, Vice-Presidents, Secretary, and Treasurer," omitting the words, "and Editor."

4. Omit entirely Article V, Section 5.

5. Amend Article VI, Section 2, to read: "It shall also decide upon the advisability of publishing the various papers presented at the annual meeting, and shall prepare for publication, contract for printing and see through the press all such papers in a volume of Annual Transactions; but all contracts for printing must first have the approval of the President and Treasurer."

6. Amend Section 2 of Article II by inserting the words "of the Marine Hospital Service" just after the word "Navy."

7. Amend Section 2 of Article III by striking out the third sentence and inserting the following: "A Literary Committee, to consist of seven members, four members from the National Guard, State troops, or militia, and one each from the Army, Navy and Marine Hospital Service."

8. Also amend same section by inserting "and Marine Hospital Service (three times) just after the word "Navy" wherever it appears.

9. Amend Section 4 of Article VI of the By-laws by substituting the words "the Navy and Marine Hospital Service" for the words, "and the Navy."

Invitations for the Next Meeting.—In connection with the next annual meeting, the Secretary desires to invite the attention of the Association to the fact that it has been invited to hold its ninth annual meeting in Buffalo, N. Y., Cleveland and Cincinnati, Ohio, and in Detroit, Michigan, by the municipal authorities of those cities, the latter being reinforced also by a letter from the Governor of the State. Suitable action is recommended in connection with these invitations.

The Transactions.—A most important and laborious part of the work which devolved upon the Secretary at the last meeting was the editing and publishing of the Transactions. The book is before you and you have already judged of its merits and its shortcomings. No one who has not undertaken such a work can have any appreciation of the magnitude of the task of producing such a book. The selection of the styles and sizes of type to be used in the various parts, the selection of the paper, the preparation of the binder's plates for the back and sides, the preparation of the illustrations, the editing of the papers into uniform shape, the classification of the contents, the preparation

of the page-headings, the reading of the proofs and submitting them to the authors, not to speak of the publication work proper, is a labor of no little difficulty.

Table of Contents.—Among the innovations in the volume is the provision of a table of contents at the beginning, giving the reader a survey of the contents without the necessity of looking through the book page by page.

Grouping Contents Into Chapters.—Another new feature is the grouping of the papers into chapters containing contributions upon similar lines, rendering its contents more readily available and more easily consulted.

Illustrations.—The abundance and beauty of the illustrations is a noteworthy feature of the book, and well exemplifies the truth of the statement that any man who can handle a camera, can be his own illustrator. It should not be thought, however, that the taking of the photograph completes the illustration, for the illustrations require even more editing than the papers. In the present book, the editing and preparation of the pictures for the engraver was an important part of the editorial work. The reproductions of Diemer's Self-Help plates, for example, required several hours of careful attention, although the translation of the text was furnished by the author of the article in connection with which they appeared.

Illustrations Among the Advertisements.—The introduction of engravings of points of interest, in connection with the meeting among the advertising pages, adds to the interest of the book as a memento of Columbus, their presence there adding to the value of advertisements while not detracting from the scientific aspect of the book.

Cost of the Transactions.—Learning from the Treasurer that there remained a surplus of seven hundred dollars from the preceding year, the Secretary arranged to publish the Transactions without drawing upon the treasury for more than that amount, making up the difference by the income from advertisements, and thus leaving to be reported at the ensuing meeting the entire income for the year untouched. This was successfully accomplished and, although the printers' bill amounted to \$1116.69, the Association was called upon for but \$700.00 of the sum.

Advertisements.—Great care was taken in connection with the advertisements that they should be reliable and high-class, and it is hoped that the choice of advertisers may meet with the approval of the Association.

Sales of Transactions.—There has been a number of calls for copies of the Transactions both at home and abroad, and, as it did not seem fair to sell the Transactions to non-members for less than the amount of the annual dues paid by the members, the Secretary and the Treasurer agreed upon a constant price of \$5.00 for the Transactions, except the smaller volumes and those in paper covers, establishing the following figures subject to the approval of the Association:

Vol. 1	\$ 50
Vol. 2	2 50
Vol. 3 (in paper covers).....	3 00
Vol. 4	5 00
Vol. 5 (in paper covers).....	4 00
Vol. 6	5 00
Vol. 7	5 00

It is urged that this price-list be officially adopted for the guidance of future officers.

Finances of the Secretary's Office.—The finances of the Secretary's office have been administered with careful attention to economy, and the office has been rather a contributor to, than a drain upon the treasury, as may be seen from the following statement:

RECEIVED.

Cash from Treasurer	\$ 50 00
Advertisements in Transactions	498 00
Initiations and other dues.....	300 00
Badges	33 00
Sale of Transactions (one copy of Vol. III).....	2 60
Merchandise orders received in payment for advertisements....	87 50

\$966 10

EXPENDED.

Transactions	\$416 69
Printing and Stationery.....	110 03
Typewriter	75 75
Clerical work	50 20
Postage and expressage	45 37
Sundries	7 00
Engraving	5 25
Check returned, "No funds".....	5 00
Merchandise orders	87 50
Cash to Treasurer	86 05
Cash on hand	82 26
	<hr/>
	\$966 10

From the foregoing, it will be seen that, while this office has drawn from the treasury the sum of \$50.00, it has turned into the treasury \$502.74, and that there still remains in the Secretary's hands, after paying all indebtedness, \$82.26 in cash and \$87.50 in good negotiable paper.

Postponement of Eighth Annual Meeting.—The opening of the Spanish War found the plans for the eighth annual meeting in a most advanced condition. The local committee of arrangements had matured all its plans for the reception of the organization, and the literary committee had prepared a superb program. The war, however, disorganized all plans. The Secretary went into the field with the first troops, and foreseeing that the hostilities would inevitably extend far beyond the date set for the meeting, he wrote from the camp at Mobile, proposing its indefinite postponement, a course which, with the approval of the Executive Committee, was adopted. It was but a few weeks more before every other officer of the Association was also in the field, together with a large proportion of its members, and the impossibility of meeting at the time originally contemplated, became an evident fact. Since that time, the official demands upon the members have been such as largely to preclude Association work, and there has been but little call upon the Secretary. To such calls as have been made he has been glad to respond, and he congratulates himself upon the fact that he has been able, notwithstanding the absorption due to extensive official responsibilities and the difficulties arising from ill-health, to perform all the duties devolving upon his office down to the present time.

Conclusion.—In conclusion, the Secretary begs to felicitate the Association upon its prosperity. With a larger membership than ever before, with its finances unimpaired, and with a new and lively interest in military affairs pervading all parts of the country, the future life of the Association would seem to have no limit to its possibilities.

III. REPORT OF THE AUDITING COMMITTEE.

THE committee appointed to audit the reports of the Secretary and Treasurer of this Association, begs leave to offer the following report:

First. That there is no report of the Treasurer in the hands of the committee or of the Association.

Second. That the cash book of the Treasurer shows that there was in bank (bank not stated), on July 14, 1899, the sum of \$1346.19. There has been paid to the Treasurer pro tem. of this meeting, up to this time, the sum of \$215.00 in dues and initiation fees, making a total of cash on hand, presumably, as there are no disbursements charged against this amount, of \$1561.19.

The committee has in its possession the undated and unsigned report of the Secretary, in which, by his showing, he has in his possession, in cash, \$82.26; and in negotiable paper, \$87.50, making a total of \$169.76; but your committee is unable to state whether this amount is actually in the hands of the Secretary or not.

Adding this amount to the cash, as above stated, makes a total of $\$1561.19 + \$169.76 = \$1731.67$.

While there is apparently a good supply of cash on hand, the committee would recommend that, to avoid confusion and misunderstanding, the dues of 1898 be collected.

The committee would further respectfully recommend, that early communication be had with Captain James E. Pilcher, Secretary, and Captain J. J. Erwin, Treasurer, in order that we may have a complete report and accounting from each.

(Signed) W. W. GRANT, Chairman.

T. C. CLARK.

CHAS. RICHARD.

IV. REPORT OF THE EXECUTIVE COMMITTEE.

THE Executive Committee has the honor to report the following list of Active and Associate Members elected at the eighth annual meeting:

ACTIVE.

Lt.-Col. James Mason Barstow, Dep. Surg. Gen., N. G., Ia.
 Brig. Gen. J. Francis Calef, Surg. Gen., N. G., Conn.
 Major E. Arthur Carr, Surg., N. G., Neb.
 Lt. George M. Coon, Asst. Surg., N. G., Minn.
 Capt. F. E. Dillenbeck, Asst. Surg., N. G., Kan.
 Lt. Asa F. Goodrich, Asst. Surg., N. G., Minn.
 Lt. R. K. Hutchings, Asst. Surg., N. G., Colo.
 Col. J. M. Keller, Surg. Gen., N. G., Ark.
 Capt. J. Baldwin McComb, Asst. Surg., O. N. G.
 Major Charles Richard, Surg., U. S. A.
 Brig. Gen. Alex. J. Stone, Surg. Gen., N. G., Minn.
 Lt. Bruce H. Stover, Asst. Surg., N. G., Ia.
 Major Geo. H. Torney, Surg., U. S. A.
 Major Joseph H. Townsend, Surg., N. G., Conn.
 Lt. Charles Bruce Walls, Asst. Surg., I. N. G.
 Capt. Allen A. Wesley, Asst. Surg., I. N. G.
 Major Edward H. Whitcomb, Asst. Surg. Gen., N. G., Minn.
 Lt. Wm. Seymour White, Asst. Surg., I. N. G.

ASSOCIATE.

W. A. Adams, late Lt. Col. and Med. Dir., Tex. V. G.
 Ole Grothan, late Maj. and Surg., 3d Neb. V. I.
 Randall R. Hunter, late Maj. and Brig. Surg., U. S. V.
 Thomas H. Manley, late P. A. Surg., 9th Mass. Vols.
 Frank H. Martin, late Lt. and Asst. Surg., U. S. V.
 Wm. Freeman Southard, late Maj. 2d Corps, Mass. Cadets.
 Jno. W. Trader, late Maj. 2nd Inf., N. G., Mo.

And to recommend for Corresponding and Honorary Membership the following:

CORRESPONDING.

W. Mitchell Banks, M. D., F. R. C. S., England.
 Surgeon Lt.-Col. Fred. W. Borden, M. P., Canada.
 Surgeon-Col. Wm. McWatters, R. A. M. C., Nova Scotia.

Lt.-Cor. Zacarias R. Molina, C. M. M. M., Mexico.
Karl Rudberg, Staff Surgeon, Swedish Navy, Sweden.
B. Tomat Suri, Surgeon Imp. Japanese Navy, Japan.

HONORARY.

Miss Clara Barton, Pres. American National Red Cross Association.

Miss Helen Gould.

Dr. Anita Newcomb McGee, late Director, D. A. R. H. Corps.

Mrs. John F. Merrill, Pres. San Francisco Red Cross Society.

Mrs. Ellen Hardin Walworth, Pres. Woman's National War Relief Association.

V. REPORT OF THE COMMITTEE "ON THE OFFICIAL RECOGNITION OF THE BADGE."

YOUR Committee on the Official Recognition of the Badge of our Association would respectfully submit the following:

Continuing the policy heretofore outlined, but this year first addressing the Surgeon-Generals instead of the Adjutant-Generals as was done last, your Committee on September 8, 1897, sent a circular letter identical with that of previous years, to the following officers, viz:

The Surgeon-General of Vermont, Maryland, North Carolina, South Carolina, Georgia, West Virginia, Mississippi, Texas, Wyoming, Missouri and Arizona.

In reply to which the requested order was received from:

North Carolina, G. O. No. 15, A. G. O., Raleigh, November 15, 1897.

Georgia, S. O. No. 21, A. G. O., Atlanta, March 22, 1898.

Texas, S. O. No. 30, A. G. O., Austin, February 2, 1898.

Wyoming, S. O. No. 1, A. G. O., Cheyenne, March 14, 1898.

Missouri, S. O. No. 78, A. G. O., City of Jefferson, October 27, 1897.

Arizona, G. O. No. 6, A. G. O., Phoenix, January 31, 1898.

Copies of which orders are filed herewith and made a part of this report.

There are now in all thirty-five States and one Territory from which orders have been issued recognizing the badge of the Association of Military Surgeons, U. S.

Farther correspondence was had with the officials of the remaining States—few in number—in which we have members, but from which the requested order has not yet been received. No doubt in a short time, not only, will these States fall into line, but every State and Territory in the Union will have membership in our Association, and will recognize it through the badge.

Regarding the recognition of the Association by the General Government, your committee regrets to report that, contrary to its anticipations, this is not yet an accomplished fact. Medical Inspector Marmion, U. S. N., our colleague on this committee, kindly consented to take charge of the very important and arduous work of bringing our request for recognition to the attention of Congress. Through his extensive correspondence and unremitting personal endeavor, a joint resolution (S. 97, herewith attached, H. 127, 55th. Congress, 2d. Session), was introduced in both branches of Congress and referred to the Committee on Military Affairs.

This resolution, taking the usual course, was referred to the War Department where, while meeting with the "entire approval" of the Surgeon-General of the Army, it was not favorably considered by the Commanding General.

The resolution was thereafter adversely reported to the Senate "with the recommendation that it be indefinitely postponed." (Report hereto attached.)

It is believed that had the highest military authority known that the chief end sought through the joint resolution, was not the mere permission to wear the badge of the Association of Military Surgeons, but, above and beyond all, the recognition of the Association which that badge typifies, he would have supported the resolution.

The objects of our organization, so noble, so far reaching, so fraught with good to our soldiers, who are our citizens as well, need only to be known to be appreciated. And your committee is well assured that when they are known our recognition by Congress will not be "indefinitely postponed."

Respectfully submitted,

(Signed) JOHN VAN R. HOFF,
Major, Surgeon, U. S. A., Chairman.

55TH. CONGRESS, 2D. SESSION—S. R. 97.

In the Senate of the United States, January 21, 1898, Mr. Hansbrough introduced the following joint resolution; which was read twice and referred to the Committee on Military Affairs.

JOINT RESOLUTION

Granting permission to officers of the Army and Navy of the United States to wear the badge adopted by the Association of Military Surgeons of the United States.

Resolved by the Senate and House of Representatives of the United States of America in Congress Assembled, That the distinctive badge adopted by the Association of Military Surgeons of the United States may be worn on all occasions of ceremony by all officers of the Medical Corps of the Army and of the Navy who may be members of said Association.

55TH. CONGRESS, 2D. SESSION—SENATE. REPORT
No. 776.

BADGE OF THE ASSOCIATION OF MILITARY SURGEONS OF THE
UNITED STATES.

March 24, 1898.—Ordered to be printed.

Mr. Hawley, from the Committee on Military Affairs, submitted the following

ADVERSE REPORT.

[To accompany S. R. 97.]

The Committee on Military Affairs, to whom was referred the joint resolution (S. R. 97) "granting permission to officers of the Army and Navy of the United States to wear the badge adopted by the Association of Military Surgeons of the United States," having obtained the opinions of the Surgeon-General, Major-General Commanding, and Adjutant-General of the Army, which are appended to and made part of this report, concur in those of the Major-General Commanding and Adjutant-General, and therefore report the bill adversely, with the recommendation that it be indefinitely postponed.

WAR DEPARTMENT,

SURGEON-GENERAL'S OFFICE, January 5, 1898.

Respectfully returned to the Adjutant-General of the Army.

This bill has my entire approval, and I believe its passage would be in the interest of the service.

GEO. M. STERNBERG,
Surgeon-General, United States Army.

HEADQUARTERS OF THE ARMY,
WASHINGTON, February 12, 1898.

The Major-General Commanding remarks that he sees no reason why permission should be granted to wear this especial badge any more than badges of other associations, of which several officers of the Army and Navy are members.

J. C. GILMORE,
Assistant Adjutant-General.

ADJUTANT-GENERAL'S OFFICE, March 3, 1898.

Respectfully returned to the Secretary of War, with reference to the remarks of the Surgeon-General and the Major-General Commanding the Army, second and fourth indorsements hereon.

It is not understood why any particular corps or department should wear a badge peculiar to that corps or department. The uniform provides the proper distinction. Medical officers should be on the same footing in respect to badges as other officers.

For this reason favorable action is not recommended.

H. C. CORBIN, Adjutant-General.

THE STATE OF WYOMING,
ADJUTANT-GENERAL'S OFFICE,
CHEYENNE, March 14, 1898.

Special Orders No. 1.

All medical officers of the Wyoming National Guard, who are members of the Association of Military Surgeons of the United States, are authorized to wear the badge of the Association on all occasions of military ceremony.

By Command of

WM. A. RICHARDS,
Governor and Commander-in-Chief.
FRANK A. STITZER,
Adjutant-General.

HEADQUARTERS NATIONAL GUARD OF MISSOURI,
ADJUTANT-GENERAL'S OFFICE,

CITY OF JEFFERSON, October 27, 1897.

Special Orders No. 78.

(Extract.)

I. The Association of Military Surgeons of the United States, having requested that the Medical Officers, N. G. M.,

members thereof, may be permitted to wear the insignia of said Association on occasions of ceremony, permission is hereby granted the Medical Officers of the National Guard of Missouri, entitled thereto by membership therein, to wear the insignia of the Association on the uniform dress coat, as requested.

By Command of the Governor:

M. F. BELL, Adjutant-General.

STATE OF NORTH CAROLINA,
ADJUTANT-GENERAL'S OFFICE,
RALEIGH, November 15, 1897.

General Orders No. 15.

The Commander-in-Chief of the military forces of North Carolina hereby officially recognizes "The Association of Military Surgeons of the United States," and the members thereof are permitted to wear the insignia of the order when in full dress or upon occasions of ceremony.

By order of the Governor and Commander-in-Chief:

A. D. COWLES, Adjutant-General.

HEADQUARTERS NATIONAL GUARD OF ARIZONA,
ADJUTANT-GENERAL'S OFFICE,
PHOENIX, ARIZONA, January 31, 1898.

General Orders No. 6.

1. Through inadvertence the following was omitted from G. O. No. 3, Current Series, these headquarters, and is therefore published for the information and guidance of all concerned:

All regimental officers desiring to purchase the full dress uniform, for regimental officers of similar rank and corps of the U. S. Army, may do so; but such full dress uniform is not obligatory and will only be worn on occasions of ceremony when not on any duty with troops.

2. Medical Officers of the National Guard of Arizona, who are members of "The Association of Military Surgeons of the United States," are authorized to wear the insignia of said Association on occasions of ceremony.

By Command of Governor: MYRON H. McCORD.

M. ALLYN LEMS,
Adjutant-General.

ADJUTANT-GENERAL'S OFFICE, STATE OF TEXAS,
AUSTIN, February 2, 1898.

Special Order No. 308.

Officers of the Medical Department, Texas Volunteer Guard, who are members of the "Association of Military Surgeons of the United States," are hereby permitted to wear the badge of the Association on occasions of ceremony, or when on duty.

By order of the Commander-in-Chief:

W. H. MABRY, Adjutant-General.

STATE OF GEORGIA, ADJUTANT-GENERAL'S OFFICE,
ATLANTA, March 22, 1898.

Special Order No. 21.

Officers of the Medical Department of the Georgia Volunteers who are members of the Association of Military Surgeons of the United States are hereby authorized to wear the insignia of that Association upon the Uniform coat on occasions of ceremony.

By order of the Governor:

OSCAR J. BROWN,
Acting Adjutant-General.

MAJOR HOFF, Surgeon, U. S. A.

VI. REPORT OF COMMITTEE ON THE INSTITUTION OF POST EXCHANGES (CANTEENS) AT ALL PERMANENT POSTS AND STATIONS OF THE ARMY, NAVY AND MARINE CORPS.

IT is the judgment of experienced medical officers of the Army that the Post Exchange, conducted in accordance with Army Regulations, is the best means of encouraging sobriety among the troops; also, that it has lessened the use of alcoholic drinks, until delirium tremens is now seldom met with.

Men enter the Army bringing with them the habits of civil life. The Canteen is a temperance measure, which, by furnishing the enlisted men malt liquors and light wines, keeps them from procuring and drinking alcoholic liquors outside the post or camp. Drunkenness among soldiers can seldom be chargeable to the Canteen properly supervised and conducted, intoxication under these conditions being almost invariably due to alcoholic liquors procured outside.

Keeping the men closely to camp or post will markedly lessen the number of cases of venereal and other contagious diseases.

Much criticism of the Canteen, as conducted by volunteer organizations during the Spanish-American war, was due to the utter disregard of Army Regulations governing the same.

The influence of the Canteen upon the health of the men being the only aspect of the subject properly presentable to a body of military medical men, your Committee entertains the opinion that the Canteen, under strict supervision and limitation as to food and drink, both in time of consumption and amount consumed, furnishes a better solution to this problem than the total abolition of the Canteen.

Soldiers are but men, taken from every walk in life, and can scarcely be expected to furnish an example of abstinence not found among their fellow men in civil life, where the home and the family circle are potent factors in moulding character and forming habits.

The Canteen in the Navy and Marine Corps has been abolished by order of the Secretary of the Navy, hence demands no further consideration from your Committee.

(Signed) A. C. GIRARD,

Major and Surgeon, U. S. A., Chairman.

H. A. ARNOLD,

Lieut. and Asst. Surgeon, Med. Dept., N. G. P.

VII. NECROLOGICAL REPORT.

MAJOR JAMES HENRY ETHERIDGE, A. M., M. D.

JAMES HENRY ETHERIDGE died February 9, 1899, at his residence in Chicago. The cause of death was fibrous myo-carditis, the result of coronary sclerosis.

He was born at St. Johnsville, N. Y., March 20, 1844. His father was a practicing physician and he was thus favored in being reared in a medical atmosphere. He was graduated from Rush Medical College in 1869. After two years of practice in Evanston, Ill., he went to Europe and devoted much time to the hospitals of London and Paris. In the summer of 1871, he returned to Chicago, which was the scene of his uninterrupted labor up to the time of his death.

He built up a large family practice, but had a strong predilection toward gynecology, and eventually devoted himself to that specialty.

Soon after his return from Europe he became a member of the Faculty of Rush Medical College, and at the time of his death, was Professor of Obstetrics and Gynecology in that institution.

As a lecturer he was plain and straightforward; his teaching was eminently practical and this, together with his happy disposition, jovial wit and apt illustrations, made him an ever-popular teacher.

In addition to his practice and his college duties Dr. Etheridge found time to take an active part in other medical matters. In 1886 he was elected President of the Chicago Medical Society, and in 1890, of the Chicago Gynecological Society. He was a member of other local and national societies and was one of the founders and a life member of the International Association of Obstetrics and Gynecology. He long served as attending physician to St. Luke's Hospital, and at the time of his death was attending gynecologist to the Presbyterian Hospital, consulting gynecologist to the St. Joseph's Hospital, and Professor of Gynecology in the Chicago Policlinic, of which institution he was one of the founders, and in the success of which he always took great pride. For many years he was Secretary of the Faculty of Rush Medical College and one of the most trusted and valuable working members of that body.

He was commissioned Major and Brigade Surgeon in the Illinois National Guard in 1894, and was assigned to duty with the First Brigade. In the same year he became a member of this Association and of the Illinois Association of Military Surgeons. His interest in medico-military matters was active and constant.

Dr. Etheridge was married in 1870 to Miss Harriet Powers, daughter of Heman G. Powers of Evanston, Ill. Mrs. Etheridge and two daughters survive him.

He will live in memory as a successful practitioner, a trained and eminent gynecologist, an operator whose dexterity and skill were most widely known, a practical and popular teacher, an active and honored participant in local and national medical affairs.

MAJOR EMMER C. FARQUHAR, M. D.

Emmer C. Farquhar was born August 16, 1844. He enlisted June 6, 1862, as a private in Co. A, 88th. O. V. I., and was discharged as corporal on the expiration of his term of service September 26, 1862. He enlisted in the United States Navy as seaman February 1, 1864, on the gunboat "Brilliant," and was discharged as yeoman, February 7, 1865.

He was graduated from Miami Medical College, Cincinnati, in 1869, and went to Zanesville, Ohio, to engage in the practice of his profession.

He was commissioned Major and Surgeon in the Ohio National Guard on January 19, 1891, and assigned to the 8th. Infantry, O. N. G.

On May 13, 1898, he was mustered into the U. S. Volunteer Service as Major and Surgeon.

He went with his regiment to Cuba, arriving at Siboney July 10th. About two weeks later he was attacked with malarial fever from which he never fully recovered, and as a result of which and an attack of pneumonia he died, at his home in Zanesville, on September 16, 1898.

He became a member of this Association in 1893.

JOHN B. HAMILTON, M. D., LL.D., EX-SUPERVISING SURGEON GENERAL, U. S. MARINE HOSPITAL SERVICE.

John B. Hamilton died on December 24, 1898, at his residence in Elgin, Ill. The immediate cause of death was hemorrhage from a perforation of the intestine communicating with a large intra-peritoneal abscess.

He was born in Jersey County, Ill., December, 1847. At the outbreak of the Civil War he entered the army, served throughout the war and at its close entered Rush Medical College, Chicago. Three years later he was graduated with high honors and began the practice of medicine in his native county. After five years, however, he entered the Army of the United States as First Lieutenant and Assistant Surgeon, and served in this capacity until 1876.

Upon his own request he was then transferred to the United States Marine Hospital Service, in which he evidenced such rare

administrative ability that within four years he had attained the position of Supervising Surgeon General. This position he retained for twelve years through several administrations of the National Government. He completely reorganized the service, and contended successfully against repeated invasions of the country by epidemic cholera and yellow fever. Under his direction a rational system of quarantine and isolation was adopted, the necessary encampments were established, and panic gave way to intelligent confidence. Many of the most important acts for the security of the public health by the National Legislature during the past twenty years were originated and guided by his enlightened intellect.

He was Professor of Surgery in Georgetown University from 1883 to 1891. He was called to the chair of Principles of Surgery in Rush Medical College and to the editorship of the Journal of the American Medical Association, in 1892, resigned his positions in Washington and removed to Chicago.

Dr. Hamilton was the leading authority of the country on all matters pertaining to epidemic disease and quarantine. His exceptional ability in this regard was demonstrated in his establishment and administration of the Florida Camp during the yellow fever epidemic of 1891 and of the Quarantine Camp at Sandy Hook, when the country was threatened by cholera in 1892.

Soon after his arrival in Chicago he was made a member and later President of the Public Library Board, and in 1897, in addition to his already arduous duties, assumed charge as "Superintendent" of the Illinois Northern Hospital for the Insane at Elgin.

He became a member of the Association of Military Surgeons of Illinois shortly after its organization, and joined the National Association in 1893.

SURGEON W. H. H. HUTTON, U. S. MARINE HOSPITAL SERVICE.

Surgeon William Henry Harrison Hutton died on June 14, 1897, after a lingering illness.

Surgeon Hutton was born in York, Jefferson County, Ohio, February 28, 1838. At the beginning of the late Civil War he enlisted in Company K, 20th. Regiment, Illinois Volunteers. After about a year's service with his regiment he was discharged, and re-enlisted in Company D, 104th. Illinois Volunteers, in

which regiment he served until the spring of 1864, when, in consequence of a wound received at Pittsburg Landing, he was sent to Chicago, Ill., and in a few months recovered sufficiently to be placed in charge of the office of the Desmarres Eye and Ear Hospital under the U. S. Army, where he remained until March 7, 1865, when he was mustered out of the Volunteer Service. By his bravery he won promotion at the battles of Chickamauga and Missionary Ridge.

He attended his first course of medical lectures at the Alabama Medical College, at Mobile, and on March 16, 1875, was graduated from the Chicago Medical College, Chicago, Ill., receiving from this institution the first prize of the faculty for the best graduating thesis.

He was appointed Assistant Surgeon in the Marine Hospital Service May 8, 1875, and was promoted to the grade of Surgeon, October 20, 1876. Surgeon Hutton, during his connection with the Marine Hospital Service, served as commanding officer at the following stations: New York, Cincinnati, New Orleans, Detroit, Louisville, Mobile and Baltimore.

In addition to the above duties, he rendered valuable service at Brunswick and Way Cross, Ga., and Camp Perry, Florida, in 1888, in enforcing the quarantine and other measures during the yellow fever epidemic of that year, and again at Brunswick, Ga., during the yellow fever epidemic in 1893. At Camp Perry he installed and was in command of the first detention camp which proved so successful in the management of the epidemic at that time raging in Jacksonville.

He was also placed in charge of the quarantine establishment at Sandy Hook, N. J., during the cholera scare in 1892, and later, in the same year, rendered efficient services in the establishment of the quarantine flotilla at Cape Charles. In 1894 he was detailed to inspect the quarantine stations along the Florida coast, and had temporary charge of the Gulf Quarantine during a part of the same year. For thirty-five years Surgeon Hutton has been serving his country in various capacities in war and pestilence, and always with a conscientious devotion to its interests, and with a zeal worthy of emulation. He was ever ready to obey a summons to duty, and oftentimes was a volunteer when epidemics threatened the country.

He became a member of this Association in 1895.

MAJOR HENRY M'ELDERRY, U. S. A.

Major Henry McElderry, Surgeon, U. S. Army, died at the Army and Navy General Hospital, Hot Springs, Arkansas, from chronic Bright's disease, on April 17, 1898, after a short illness. He was born in Baltimore, Maryland, August 12, 1842, and was appointed from the same State.

This officer had a long and distinguished career in the service, entering it first as private, Co. A, 10th. Maryland Infantry, on the 19th. of June, 1863, during the Civil War. He was promoted to Hospital Steward on the 6th. of July, 1863, from which position he was discharged on the 29th. of January, 1864. He then re-entered the Medical Service as Medical Cadet on the 30th. of March, 1864, retaining that position until the 30th. of March, 1865, and on the 28th. of February, 1866, having in the meantime been approved by an Army Medical Examining Board, he was commissioned an Assistant Surgeon in the Medical Department of the Army. He became Assistant Surgeon, with the rank of Captain, on the 28th. of February, 1869, and Surgeon, with the rank of Major, on the 7th. of December, 1884.

During his long service he was stationed at various posts in the United States, and occupied many positions of importance. His first important service was in Texas, where a portion of the time he was in the field with the 6th. U. S. Cavalry. Next he served at Fort Klamath, Oregon, from which place he went on duty in the field against the Modoc Indians, from December, 1872, to May, 1873, and he distinguished himself and was commended for his soldierly conduct under fire and professional skill during the battle of the Modoc Caves. In 1876 he came East and was on duty at Washington Arsenal and Fort Monroe, and in 1877, with the troops in the field during the riots in Pennsylvania. His next change was to the Department of the Platte in 1880, where he was on duty at camp on White River, Colorado, Fort Bridger, Wyoming, and Fort Robinson, Nebraska. At the World's Industrial and Cotton Exposition in New Orleans in 1884-5, he was on duty in charge of the Medical Department exhibit.

He next served at Fort Wayne, Michigan, as a member of the Army Medical Board in New York City, and in 1890 became

Post Surgeon at U. S. Military Academy, West Point, New York, remaining there until December, 1892.

His next service was at Omaha, Nebraska, as Attending Surgeon at Department Headquarters, and afterwards at Fort Robinson and Fort Niobrara, Nebraska.

He married in Baltimore, Maryland, in the fall of 1896, and leaves a widow surviving him, but no children.

His last service was at Fort Leavenworth, Kansas, from November, 1896, to just before his death, April 17, 1898, which occurred at the Army and Navy General Hospital, Hot Springs, to which place he had been sent in hopes of relief.

The record of the varied, important and faithful service of this officer would seem to be his best eulogy.

He became a member of this Association in 1897.

BRIGADIER-GENERAL ALBERT ORDWAY, N. G., D. C.

Brigadier-General Albert Ordway died in New York City, November 21, 1897.

General Ordway was the organizer of the District of Columbia National Guard, and commanded the brigade from its earliest days to the time of his death. His many most excellent qualities were well known throughout the command, the community, and the country at large.

He was born in Boston, February 24, 1843. When the war broke out he was a pupil of Prof. Louis Agassiz in the Lawrence Scientific School of Harvard University. He enlisted in the 4th. Battalion of Massachusetts Militia in April, 1861, and in September of the same year was appointed First Lieutenant in the 24th. Massachusetts Infantry, one of the regiments selected for the Burnside expedition to North Carolina. He was the youngest officer in his regiment, but quickly gained the confidence of his superiors, and at the battle of New Berne performed an act of personal gallantry that resulted in his appointment as adjutant of the regiment. He participated in all the campaigns and engagements in North Carolina in 1862. In December his regiment was ordered to South Carolina, but Adjutant Ordway was detailed in the North State for an especial duty. At the close of this service, General Henry Prince appointed him Aid-de-Camp

and Acting Adjutant-General of his division, in which capacity he served until June, 1863, when he was ordered with General Prince to the Army of the Potomac, where he served on the staff of the 2d. Division, 3d. Army Corps.

After the battle of Mine Run, at the close of the campaign of 1863, he rejoined his regiment on his own application, and applied himself to the study of artillery matters. In the spring of 1864 his regiment was sent to Virginia. General Terry detached him and appointed him ordnance officer of the division. In this campaign, while on the staff of General Terry, he became distinguished for personal gallantry, and was promoted successively to be Captain, Major, and Lieutenant-Colonel, in which capacity he was placed in command of his regiment at the age of twenty-one years.

After the close of the campaign in 1864, General Ord assigned Colonel Ordway to command the post at Bermuda Hundred, the depot of the Army of the James, a difficult position, and one in which the young officer discharged his duty with marked ability. After the occupation of Richmond, and but a few weeks after he had reached the age of twenty-two years, he was promoted to be Colonel of the regiment and was brevetted Brigadier-General. His regiment, which was noted for its discipline, drill, and reliability, was selected for special duty within the city limits of Richmond, and he was appointed Provost-Marshal-General of the State of Virginia. The processes incidental to "reconstruction" rendered this task most delicate, but he secured and retained the esteem of the people over whom he practically ruled, as well as of his superior officers. Both Colonel Ordway and his regiment were retained in service until February, 1866, being the last volunteer troops to be mustered-out in the State.

After being mustered-out, General Ordway was offered a commission as Major in the regular service, but, preferring to return to civil life, he declined the appointment and engaged in business in Richmond. In 1877 he removed to Washington, D. C., which has since been his home. April 19, 1887, he was commissioned Brigadier-General commanding the District of Columbia Militia.

General Ordway was elected an Associate Member of the Association in 1894.

MAJOR GEORGE HENRY ROHÉ, M. D.

Major George Henry Rohé died at New Orleans, February 6, 1899, suddenly, of heart disease. He was a son of John and Margaret Rohé, both natives of Bavaria, and was born January 26, 1851, in Baltimore County. He was educated in the public and parish schools in Baltimore city and county, and began the study of medicine in 1867 under the late Prof. August F. Erich. He attended three courses of lectures at the University of Maryland School of Medicine, and was graduated therefrom in March, 1873. He afterward studied dermatology in Boston under Dr. Edward Wigglesworth. After some years spent in travel he returned to Baltimore and engaged in general practice until his appointment by Mayor Davidson as City Health Commissioner in 1890. For a short time, in 1885, he was Acting Assistant Surgeon in the United States Army. He had been professor in the College of Physicians and Surgeons since 1881, and filled the chairs of Therapeutics, Materia Medica, Hygiene and Mental Diseases. He was appointed Superintendent of Spring Grove Asylum in 1891, and in 1896 was selected to take charge of the new asylum at Springfield.

Dr. Rohé was a member of the American Medical Association; American Public Health Association; American Association of Obstetricians and Gynecologists, and its President in 1893; the Medical and Chirurgical Faculty of Maryland, and its President in 1893; the American Medico-Psychological Association; American Electro-Therapeutic Association; Clinical Society of Maryland; Baltimore Medical Association; Baltimore Neurological Society; Medical and Surgical Society of Baltimore; Southern Surgical and Gynecological Association; was a member of the Committee on Organization of the first Pan-American Congress; American Academy of Political and Social Science; Foreign Associate Member of the Société Française d'Hygiène, and Secretary and Treasurer of the Rush Monument Committee.

Dr. Rohé introduced a number of new methods of treatment of the insane, which have been adopted in a number of insane hospitals in the country and have received recognition abroad. In 1894 he was elected an Honorary Member of the Society of Mental Medicine of Belgium, and Corresponding Member of the

Medico-Psychological Society of Paris. Dr. Rohé was the author of many papers published in the transactions of the American Medical Association and of the American Public Health Association. He published a "Text-Book of Hygiene," which ran through three editions; a work on "Practical Electricity in Medicine and Surgery," and a "Manual of Skin Diseases." He was Associate Editor of the Annual of the Universal Medical Sciences.

Dr. Rohé was married in 1890 to Miss Mary Lauderman Coffin, of Baltimore, a descendant of Tristram Coffin, the original settler of Nantucket Island in 1660. He is survived by his wife and one child—Margaret Rohé.

He was commissioned Major and Surgeon in the Maryland National Guard in September, 1892, and afterward served in the same capacity in the Fifth Regiment Veteran Corps. He became a member of this Association May 25, 1897.

MAJOR LAWRENCE SAVERY SMITH, M. D., N. G., PA.

Major Lawrence S. Smith died on the 15th. day of August, 1898, on board the U. S. S "Relief," off the coast of Porto Rico. Major Smith was born on the 3d. of April, 1868. His early schooling and preparation for college was at the Cheltenham Military Academy near Philadelphia. He entered the University of Pennsylvania, Department of Arts, in 1884, graduating in 1888. He spent three years in the medical department at the University of Pennsylvania and graduated in 1891. For two years he was resident physician at the Pennsylvania Hospital and the University Hospital, and spent one year finishing his studies in Germany. After that he practiced medicine in Philadelphia.

He was appointed Assistant Surgeon of the First Regiment Infantry, N. G., Pa., on April 11, 1893, when he was duly commissioned by the Governor and Commander-in-Chief, with the rank of First Lieutenant. He served until June 6, 1894, when he resigned. He was appointed and re-commissioned Assistant Surgeon, with the rank of First Lieutenant, on October 9, 1894, and was promoted to the position of Surgeon of the regiment, with the rank of Major, July 16, 1895, which position he held at the time the regiment was ordered into the field in the war with

Spain on April 28, 1898. He volunteered and was regularly mustered into the United States Service as Major and Surgeon of this regiment, which was the First Pennsylvania Volunteer Infantry, in the war with Spain, he being mustered on the 5th. day of May, 1898. He served with the command as its Surgeon at Camp Hastings, Mt. Gretna, Pa., and proceeded with it to Camp Thomas, Chickamauga, Georgia, where he remained on duty until he was ordered to Porto Rico. He was quite unwell when he left for Porto Rico.

He became a member of the Association in 1893.

SURGEON LIEUTENANT-COLONEL FREDERICK WM. STRANGE,

M. R. C. S.

Surgeon Lieutenant-Colonel Frederick Wm. Strange was one of the most distinguished of Canadian surgeons. His untimely removal, on the 4th. of June, 1897, at the early age of fifty-three, is deeply regretted by a large circle of friends, while the loss of his services by the hospitals and the militia is greatly to be deplored. Dr. Strange was the son of Mr. Thomas Strange of Sulhamstead, Berkshire, England; was educated at Bath and Winchester, and studied medicine in Liverpool and at University College, London, passing his examination as a Member of the Royal College of Surgeons in 1866. From 1866 to 1869 he was an assistant surgeon to the London Women's Hospital, which post he resigned in 1869 to come to Canada. He settled at Aurora, in the County of York, and soon acquired a large practice. He removed to Toronto in 1879, where his deservedly great reputation followed him. He acquired one of the most extensive consulting practices in Canada. He sat in the Dominion House of Commons as a Conservative member for North York from 1878 to 1882. He again contested the constituency in 1896, but was unsuccessful. He was for many years identified with the Canadian Militia, having been a Captain in the 12th. York Infantry and afterwards in the Queen's Own Rifles of Toronto, of which regiment he afterwards became Surgeon. On the establishment of the Royal Regiment of Canadian Infantry in 1883, he was appointed Surgeon attached to "C" Company at Toronto.

On the breaking out of the Northwest Rebellion in 1885 he accompanied his corps to the front, and was appointed Brigade Surgeon of the Battleford column. He served with such distinction as to be specially mentioned in dispatches, and at the conclusion of the campaign was specially recommended for promotion. He was for many years principal medical officer of the Niagara Camp. He became a Surgeon Lieutenant-Colonel in 1893, and was appointed a Deputy Surgeon-General in 1895. Dr. Strange was a brave soldier, a skilful surgeon, a humane physician, a warm friend and an honorable colleague. His place is hard to fill. He was elected a Corresponding Member of the Association in 1892.

SURGEON MAJOR-GENERAL SIR WILLIAM ALEXANDER MACKINNON,

F. R. C. S., LL.D., K. C. B., ETC.

Sir William A. Mackinnon, Director General (Retired), of the British Army Medical Department, died October 28, 1897, at the age of sixty-seven years. He saw active service in the Crimean War and was present at Alma, Balaclava, and the siege of Sebastopol, receiving in recognition of his services the medal with three clasps, the Knighthood of the Legion of Honor, and the Turkish medal. During the Indian Mutiny, he was Surgeon on the personal staff of Lord Clyde. He again saw active service in New Zealand and, at the storming of the Gate Pah, when the other officers were one by one killed or wounded, he took command of the men, rushed the Pah, captured it, and in doing so, necessarily killed and wounded numbers of the enemy; it was quite characteristic of him that after the action, he relapsed into the enthusiastic surgeon and conscientiously operated upon several wounds of his own making. After acting as Assistant Professor of Clinical and Military Surgery at Netley, he accompanied the Ashanti Expedition as principal medical officer and occupied the same post at Malta and Gibraltar in 1880 and the nine following years. He was appointed Director General in 1889 and retired in 1896. His membership in this Association dated from 1892, when he was elected an Honorary Member; being transferred, however, to the Corresponding list upon the establishment of that class in 1895.

In the absence of a formal report from the Committee on Necrology, the Publication Committee desires to acknowledge its indebtedness to the Editor of the Journal of the American Medical Association; Supervising Surgeon-General Walter C. Wyman, U. S. M. H. S.; Assistant Surgeon-General C. H. Alden, U. S. A.; Adjutant-General C. H. Heyl, N. G., D. C.; Commodore A. L. Gihon, Medical Director (Ret.), U. S. N., and Captain James E. Pilcher, U. S. A., for information relative to deceased members of the Association.

VIII. REPORT OF THE NOMINATING COMMITTEE.

THE Nominating Committee of the Association of Military Surgeons of the United States, for 1899, has the honor to report the following for officers for the ensuing year:

PRESIDENT.

Col. C. H. Alden, Asst. Surg.-Gen., U. S. A.

FIRST VICE-PRESIDENT.

Brig.-Gen. Geo. Cook, Surg.-Gen. (Ret.), N. G., N. H.

SECOND VICE-PRESIDENT.

Capt. Geo. Worth Woods, Med. Dir., U. S. Navy.

SECRETARY.

Lieut.-Col. Charles Adams, Asst. Surg.-Gen., I. N. G.

TREASURER.

Lieut. Herbert A. Arnold, Asst. Surg., N. G., Pa.

The Association has been invited to hold its next meeting at the following places:

Cincinnati, O.; Cleveland, O.; Detroit, Mich.; New York, N. Y.; San Francisco, Cal.; St. Paul, Minn., and Washington, D. C.

(Signed) G. H. HALBERSTADT, Secretary.

I. ROSTER OF VOLUNTEER MEDICAL OFFICERS
WHO SERVED DURING THE SPANISH-AMERICAN
WAR OF 1898, IN THE MILITARY AND NAVAL
SERVICES.

COMPILED BY C. H. ALDEN,

WASHINGTON, D. C.,

ASSISTANT SURGEON-GENERAL, U. S. ARMY.

THE purpose of this paper is simply to place on record for convenient reference the names of Volunteer Medical Officers who served during the Spanish-American War of 1898. In the case of Medical Officers of the Volunteer Staff proper (Chief and Brigade Surgeons), the rank, state from which appointed, date of acceptance and discharge, and command to which they were attached are given. In the case of Regimental Medical Officers, their rank, regiment, date of muster-in and muster-out or discharge are given. The list of Volunteer Naval Medical Officers gives rank, the state from which appointed, date of appointment and discharge, and the ship or duty to which they were assigned. About one hundred and fifty names included in this list were those of members of the Association. It will be readily understood that absolute accuracy cannot be guaranteed, though great care to secure that end has been taken. We are indebted to the courtesy of General Ainsworth, Chief of the Record and Pension Division of the War Department for the list of Regimental Medical Officers, and to the Surgeon-General of the Navy for the list of Volunteer Naval Medical Officers. The list of Medical Officers of the Volunteer Staff proper (Chief Surgeons and Brigade Surgeons) has been compiled from the records of the Surgeon-General's Office. I would gladly have added the names of Contract Surgeons to this list, for among them were many most efficient and deserving men, distinguished by their skill and devotion to the sick and wounded, but as there have been about ~~897~~ altogether in service, the extension of this list to include them would expand it beyond possibility of publication. As it is, the list is a very large one. It will be useful, as has been intimated, for reference. The Publication Committee can perhaps condense it to practicable limits.

There are properly given first as a "Roll of Honor," the names of Medical Officers, U. S. and Volunteer, Army and Navy, and of Contract Surgeons, who died from wounds or disease while in the service of the United States. No doubt there are others who

have died from disease incurred in the service, after they left the service of the United States whose names would, if known, be properly added to this "Roll of Honor." The names here given are those that are found on the official records of the War Department.

Of the twenty Medical Officers whose names appear in this list, five belonged to the U. S. Medical Staff, one being also a Brigade Surgeon of Volunteers. Seven were Regimental Medical Officers, one a Volunteer Naval Medical Officer, and seven Contract or Acting Assistant Surgeons. Two of this number (twenty) died from wounds received in action, four of yellow fever, eight from typhoid fever, two of pernicious malarial fever, the remainder from various causes incident to service.

The outbreak of the war came upon the country in a state of profound peace. The number of officers in the U. S. Army, hardly sufficient for the peace establishment of 25,000, was entirely inadequate to the new army of some 275,000 rapidly placed under arms, and a large number of Medical Officers was necessarily drawn from civil life for the Volunteer Medical Staff and the Volunteer Regiments, and for Contract Surgeons.

It was most fortunate that the Association of Military Surgeons of the United States had been founded in 1891, and has thus been the means of disseminating medico-military knowledge among its members, many of whom, numbering at least 150, entered the U. S. Service during the Spanish-American War and rendered valuable aid. It is impossible to name them, but I must call your attention to the fact that among these members who were in service during this brief war, there were three presidents, six vice-presidents, ten other officers, besides many members of its committees. They served as Chief Surgeons of Corps, Divisions, and Brigades, as Regimental Medical Officers in charge of General and Field Hospitals,—in short, in every position and in every duty to which a military surgeon may be called. Their record is one of hard and often unthankful work, often amid many discouragements and under many difficulties, under new and trying climatic conditions, but always with untiring zeal, enlightened skill and enthusiastic devotion. The wise forethought of the distinguished founder of the Association, General N. Senn, has borne most fruitful results. While it is manifestly impossible to weigh and measure the good thus accomplished by the Association, there can be no room for doubt that the lessons learned

through the Association, the papers contributed to its transactions and discussions held at its meetings were of immense value in securing better sanitation of the troops and in the better treatment of sick and wounded in camp and in battle.

It is a source of profound congratulation and just pride to the members of this Association that this organization has been able to render such conspicuous service to our country in its time of need and emergency. Our efforts toward its continued improvement and enlarged usefulness ought to be greatly stimulated and quickened. I trust we shall have a large access of members from the Medical Officers who have served during the Spanish War, whose service has now rendered them eligible to election.

MEDICAL OFFICERS OF THE ARMY, VOLUNTEERS, NAVY, AND
CONTRACT SURGEONS, WHO HAVE DIED OF WOUNDS OR
DISEASES INCIDENT TO THE SPANISH WAR.

MEDICAL OFFICERS, U. S. ARMY.

Major George McCreery, Surgeon, U. S. Army, died on S. S. "Catania," August 23, 1898, en route to the United States, from dysentery, following yellow fever. Buried at sea.

Captain Madison M. Brewer, Assistant Surgeon, U. S. Army, died at Garfield Hospital, Washington, D. C., October 4, 1898, from typhoid fever.

Captain Harlan E. McVay, Assistant Surgeon, U. S. Army, died at Manila, Philippine Islands, January 4, 1899, from typhoid fever.

First Lieutenant Richard B. Westnedge, Assistant Surgeon, U. S. Army, died at Manila, Philippine Islands, June 10, 1899, from typhoid fever.

Major Paul Clendenin, Chief Surgeon, U. S. Volunteers (Captain and Assistant Surgeon, U. S. Army), died at Santiago, Cuba, July 4, 1899, from yellow fever.

VOLUNTEER MEDICAL OFFICERS, U. S. ARMY.

First Lieutenant Lorenzo S. Cole, Assistant Surgeon, 6th. Illinois Inf. Vols., mustered-in May 11, 1898, died May 23, 1898, at Fort Wayne, Indiana, from pneumonia.

Surgeon Henry C. Bowen, 2d. Massachusetts Inf. Vols., mustered-in May 4, 1898, died August 13, 1898, at Santiago, Cuba, (2d. Division 5th. Army Corps Hospital), from typhoid fever.

Surgeon Lawrence S. Smith, 1st. Pennsylvania Vol. Inf., mustered-in May 5, 1898, died August 17, 1898, on Hospital Ship "Relief," from typhoid fever.

First Lieutenant John A. Bobb, Assistant Surgeon, 34th. Michigan Inf. Vols., mustered-in May 9, 1898, died August 19, 1898, on Hospital Ship "Olivette," Hampton Roads, Virginia, from pernicious remittent fever.

First Lieutenant George Lindheim, Assistant Surgeon, 8th. New York Inf. Vols., mustered-in May 17, 1898, died September 16, 1898, at New York City, from typhoid fever.

Surgeon Emmer C. Farquhar, 8th. Ohio Inf. Vols., mustered-in May 13, 1898, died September 17, 1898, at Zanesville, Ohio, disease not reported.

First Lieutenant James Wood, Assistant Surgeon, 202d. New York Inf. Vols., mustered-in July 5, 1898, died March 3, 1899, at Havana, Cuba, from pernicious malaria.

VOLUNTEER MEDICAL OFFICERS, U. S. NAVY.

Assistant Surgeon John B. Gibbs, killed in action at Guantanamo, Cuba, June 12, 1898.

CONTRACT SURGEONS, U. S. ARMY.

Dr. H. W. Danforth, contract dated May 2, 1898, died July 4, 1898, at Santiago, Cuba, of wounds received in action.

Dr. E. S. Tyner, contract dated August 6, 1898, died September 7, 1898, at Santiago, Cuba, of yellow fever.

Dr. Francis Lieber, contract dated April 28, 1898, died October 10, 1898, at Fernandina, Florida, of typhoid fever.

Dr. Perry H. Benscoter, contract dated October 1, 1898, died November 3, 1898, at John Blair Gibbs Hospital, Lexington, Kentucky, of typhoid fever.

Dr. Charles S. Pinckney, contract dated August 29, 1898, died December 27, 1898, at Fort Thomas, Kentucky, of septic empyema.

Dr. Frederick W. Fabricius, contract dated September 10, 1898, died June 25, 1899, at Santiago, Cuba, of yellow fever.

Dr. John V. Hamilton, contract dated July 22, 1898, died July 26, 1899, at Post Hospital, Matanzas, Cuba, of renal congestion with uremia and chronic interstitial nephritis.

LIST OF MEDICAL OFFICERS OF THE NATIONAL GUARD WHO SERVED IN THE VOLUNTEER ARMY
DURING THE WAR WITH SPAIN.

60

ASST. SURG.-GEN. C. H. ALDEN.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
ALABAMA.				
Kernachan, William J.....	Major and Surg.....	1st Infantry	May 10, 1898.....	M. O. Oct. 31, '98.
Fletcher, Richard M. Jr.....	1st Lieut. and Asst. Surg....	1st Infantry	May 20, 1898.....	M. O. Oct. 31, '98.
Morris, Lewis C.....	1st Lieut. and Asst. Surg....	1st Infantry	May 11, 1898.....	M. O. Aug. 30, '98.
Johnston, Hardee.....	1st Lieut. and Asst. Surg....	1st Infantry	May 11, 1898.....	Resigned Aug. 30, '98.
Pugh, Sidney S.....	Major and Surg.....	2d Infantry	May 12, 1898.....	M. O. Oct. 31, '98.
McLean, James N.....	1st Lieut. and Asst. Surg....	2d Infantry	June 4, 1898.....	Resigned Oct. 12, '98.
Weedon, Walter R.....	1st Lieut. and Asst. Surg....	2d Infantry	June 4, 1898.....	M. O. Oct. 31, '98.
Long, Clarence H.....	Major and Surg.....	3d Infantry	July 1, 1898.....	M. O. March 20, '99.
Mullins, Thomas K.....	1st Lieut. and Asst. Surg....	3d Infantry	June 11, 1898.....	M. O. March 20, '99.
Luckie, Dabney.....	1st Lieut. and Asst. Surg....	3d Infantry	July 6, 1898.....	M. O. March 20, '99.
ARKANSAS.				
Minor, James C.....	Major and Surg.....	1st Infantry	May 9, 1898.....	M. O. Oct. 25, '98.
Hay, Eugene C.....	1st Lieut. and Asst. Surg....	1st Infantry	May 9, 1898.....	M. O. Oct. 25, '98.
Meriwether, Clint. P.....	1st Lieut. and Asst. Surg....	1st Infantry	May 9, 1898.....	M. O. Oct. 25, '98.
Orto, Zaphney.....	Major and Surg.....	2d Infantry	May 9, 1898.....	Resigned Oct. 8, '98.
Wells, Horatio.....	Major and Surg.....	2d Infantry	May 9, 1898.....	M. O. Feb. 25, '99.
Abington, E. H.....	1st Lieut. and Asst. Surg....	2d Infantry	May 9, 1898.....	Resigned July 7, '98.
King, Strodger U.....	1st Lieut. and Asst. Surg....	2d Infantry	August 2, 1898.....	M. O. Feb. 25, '99.
Enders, Robert M., Sr.....	1st Lieut. and Asst. Surg....	2d Infantry	October 28, 1898.....	M. O. Feb. 25, '99.
CALIFORNIA.				
McCarthy, William D.....	Major and Surg.....	1st Infantry	May 4, 1898.....	Still in service.
Farrell, Patricienne J. H....	Captain and Asst. Surg....	1st Infantry	May 4, 1898.....	Resigned March 13, '99.
Rethers, Theodore.....	Captain and Asst. Surg....	1st Infantry	May 4, 1898.....	Resigned Oct. 28, '98.
O'Brien, Aloysius P.....	Captain and Asst. Surg....	1st Infantry	May 24, 1898.....	Resigned Feb. 14, '99.
Painter, George L.....	1st Lieut. and Asst. Surg....	1st Infantry	February 17, 1899.....	Still in service.

CALIFORNIA—Cont.				
Pedlar, A. J.	Captain and Asst. Surg.	1st Battalion H'vy Artillery.	May 9, 1898.	Discharged Oct. 13, '98.
Hanna, W. J.	Captain and Asst. Surg.	1st Battalion H'vy Artillery.	October 19, 1898.	Still in service.
Rottanzi, T. A.	Captain and Asst. Surg.	6th Infantry	May 4, 1898.	M. O. Dec. 15, '98.
Rogers, Charles A.	Captain and Asst. Surg.	6th Infantry	May 8, 1898.	M. O. Dec. 15, '98.
Choate, James J.	Major and Surg.	7th Infantry	May 8, 1898.	M. O. Dec. 2, '98.
Roblee, William W.	Captain and Asst. Surg.	7th Infantry	May 8, 1898.	M. O. Dec. 2, '98.
Russell, Philip N.	Captain and Asst. Surg.	7th Infantry	May 13, 1898.	M. O. Dec. 2, '98.
Ladd, Ira B.	Captain and Asst. Surg.	7th Infantry	June 1, 1898.	Resigned Oct. 11, '98.
Shields, George F.	Major and Surg.	8th Infantry	June 22, 1898.	M. O. July 18, '98.
Dudley, Frank W.	Major and Surg.	8th Infantry	June 22, 1898.	M. O. Feb. 6, '99.
Yost, John D.	1st Lieut. and Asst. Surg.	8th Infantry	To date, June 22, 1898.	M. O. Jan. 31, '99.
McGettigan, Charles D.	1st Lieut. and Asst. Surg.	8th Infantry	July 19, 1898.	M. O. Feb. 2, '99.
COLORADO.				
Kemble, Lewis H.	Major and Surg.	1st Infantry	May 25, 1898.	Still in service.
Locke, Charles E.	Captain and Asst. Surg.	1st Infantry	May 25, 1898.	Still in service.
Thornton, David D.	1st Lieut. and Asst. Surg.	1st Infantry	May 25, 1898.	Still in service.
CONNECTICUT.				
Rockwell, Thomas F.	Major and Surg.	1st Infantry	May 18, 1898.	M. O. Oct. 31, '98.
McCook, John B.	1st Lieut. and Asst. Surg.	1st Infantry	May 18, 1898.	M. O. Oct. 31, '98.
Griswold, Richard S.	1st Lieut. and Asst. Surg.	1st Infantry	May 18, 1898.	M. O. Oct. 31, '98.
La Pierre, Julian.	Major and Surg.	3d Infantry	June 22, 1898.	Resigned Sept. 21, '98.
Thomson, Hiram B.	Major and Surg.	3d Infantry	June 22, 1898.	M. O. March 20, '99.
Blackmar, John S.	1st Lieut. and Asst. Surg.	3d Infantry	October 3, 1898.	M. O. March 20, '99.
Lee, Henry M.	Asst. Surg.	3d Infantry	June 22, 1898.	M. O. March 20, '99.
DELAWARE.				
France, James L.	Major and Surg.	1st Infantry	May 7, 1898.	M. O. Nov. 16, '98.
McCausland, James R.	1st Lieut. and Asst. Surg.	1st Infantry	May 7, 1898.	Resigned Oct. 6, '98.
Jakes, Charles R.	1st Lieut. and Asst. Surg.	1st Infantry	May 7, 1898.	M. O. Dec. 19, '98.
DIST. OF COLUMBIA.				
Pyles, Richard A.	Major and Surg.	1st Infantry	May 11, 1898.	M. O. Nov. 20, '98.
Weaver, Clarence A.	1st Lieut. and Asst. Surg.	1st Infantry	May 11, 1898.	M. O. Nov. 20, '98.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Rank.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Cox, Samuel C.	1st Lieut. and Asst. Surg.	DIST. COLUMBIA.—Cont. 1st Infantry	May 11, 1898	M. O. Nov. 20, '98.
Dunham, C. A.	Asst. Surg.	FLORIDA. 1st Infantry	May 21, 1898	M. O. Jan. 27, '99.
Izlar, R. P.	Major and Surg.	1st Infantry	April 25, 1898	M. O. Dec. 3, '98.
McKinnon, C. B.	Asst. Surg.	1st Infantry	May 21, 1898	M. O. Dec. 3, '98.
Jarrall, Joseph G.	1st Lieut. and Asst. Surg.	GEORGIA. 1st Infantry	May 6, 1898	M. O. Nov. 18, '98.
Little, William J.	1st Lieut. and Asst. Surg.	1st Infantry	May 5, 1898	M. O. Nov. 18, '98.
Garrard, James I.	Major and Surg.	1st Infantry	May 6, 1898	M. O. Nov. 18, '98.
Davis, Edward C.	Major and Surg.	1st Infantry	May 5, 1898	M. O. Nov. 20, '98.
Geer, Charles C.	1st Lieut. and Asst. Surg.	2d Infantry	May 5, 1898	M. O. Nov. 30, '98.
Moncrief, W. H.	1st Lieut. and Asst. Surg.	2d Infantry	May 7, 1898	M. O. Nov. 30, '98.
Vrandy, Luther B.	Major and Surg.	3d Infantry	June 27, 1898	M. O. April 22, '99.
Pate, Redding H.	1st Lieut. and Asst. Surg.	3d Infantry	June 27, 1898	M. O. April 22, '99.
Harris, Stephen T.	1st Lieut. and Asst. Surg.	3d Infantry	June 27, 1898	M. O. April 22, '99.
Springer, Warren D.	Major and Surg.	IDAHO. 1st Infantry	May 7, 1898	Still in service.
Conant, Jesse L., Jr.	1st Lieut. and Asst. Surg.	1st Infantry	May 15, 1898	Still in service.
Cuthbertson, William.	Major and Surg.	ILLINOIS. 1st Cavalry	May 21, 1898	Resigned June 29, '98.
Robeson, T. Jay.	Major and Surg.	1st Cavalry	May 21, 1898	M. O. Oct. 11, '98.
Rowe, Jesse.	Captain and Asst. Surg.	1st Cavalry	May 21, 1898	M. O. Oct. 11, '98.
Mowry, Albert E.	1st Lieut. and Asst. Surg.	1st Cavalry	May 21, 1898	M. O. Oct. 11, '98.
Willard, William G.	Major and Surg.	1st Infantry	May 13, 1898	M. O. Nov. 17, '98.
Roberts, Thomas E.	Captain and Asst. Surg.	1st Infantry	May 13, 1898	M. O. Nov. 17, '98.

ILLINOIS.—Cont.

Walls, C. Bruce.....	1st Lieut. and Asst. Surg.....	1st Infantry.....	May 13, 1898.....	M. O. Nov. 17, '98.
Lydston, G. Frank.....	Major and Surg.....	2d Infantry.....	May 14, 1898.....	Resigned June 21, '98.
Marquis, George Paull.....	Major and Surg.....	2d Infantry.....	May 15, 1898.....	M. O. April 26, '99.
Byrne, John G.....	1st Lieut. and Asst. Surg.....	2d Infantry.....	May 16, 1898.....	Resigned Oct. 3, '98.
Bath, Thomas W.....	1st Lieut. and Asst. Surg.....	2d Infantry.....	January 31, 1899.....	M. O. April 26, '99.
Porter, Ralph S.....	1st Lieut. and Asst. Surg.....	2d Infantry.....	July 7, 1898.....	M. O. April 26, '99.
Shaw, John Bliss.....	Major and Surg.....	3d Infantry.....	May 10, 1898.....	M. O. Jan. 24, '99.
Lemke, August F.....	Captain and Asst. Surg.....	3d Infantry.....	May 7, 1898.....	M. O. Jan. 24, '99.
Starrett, Carlton E.....	1st Lieut. and Asst. Surg.....	3d Infantry.....	May 7, 1898.....	M. O. Jan. 24, '99.
McCord, Thomas Chester.....	Major and Surg.....	4th Infantry.....	May 20, 1898.....	M. O. May 2, '99.
Hilyard, George E.....	1st Lieut. and Asst. Surg.....	4th Infantry.....	May 20, 1898.....	M. O. May 2, '99.
Galbraith, Charles M.....	1st Lieut. and Asst. Surg.....	4th Infantry.....	May 20, 1898.....	M. O. May 2, '99.
Keeley, Milton R.....	Major and Surg.....	5th Infantry.....	May 20, 1898.....	M. O. May 2, '99.
Bevans, James L.....	Captain and Asst. Surg.....	5th Infantry.....	May 7, 1898.....	M. O. Oct. 16, '98.
Ames, Edwin W.....	1st Lieut. and Asst. Surg.....	5th Infantry.....	May 7, 1898.....	M. O. Oct. 16, '98.
Anthony, Frank.....	Major and Surg.....	6th Infantry.....	May 11, 1898.....	M. O. Nov. 25, '98.
Cole, Lorenzo S.....	1st Lieut. and Asst. Surg.....	6th Infantry.....	May 11, 1898.....	Died May 23, '98.
Whiteside, Charles E.....	1st Lieut. and Asst. Surg.....	6th Infantry.....	June 29, 1898.....	M. O. Nov. 25, '98.
Robbins, Charles A.....	1st Lieut. and Asst. Surg.....	6th Infantry.....	May 11, 1898.....	M. O. Nov. 25, '98.
Sullivan, Thomas J.....	Major and Surg.....	7th Infantry.....	May 18, 1898.....	M. O. Oct. 20, '98.
Mahoney, George W.....	Captain and Asst. Surg.....	7th Infantry.....	May 18, 1898.....	M. O. Oct. 20, '98.
St. Clair, Frank P.....	Lieut. and Asst. Surg.....	7th Infantry.....	May 18, 1898.....	M. O. Oct. 20, '98.
Wesley, Allen A.....	Major and Surg.....	8th Infantry.....	July 21, 1898.....	M. O. April 3, '99.
Curtis, James W.....	1st Lieut. and Asst. Surg.....	8th Infantry.....	July 21, 1898.....	M. O. April 3, '99.
Miller, Edward S.....	1st Lieut. and Asst. Surg.....	8th Infantry.....	July 21, 1898.....	M. O. April 3, '99.
Hall, Andy.....	Major and Chief Surg.....	9th Infantry.....	July 2, 1898.....	M. O. May 29, '99.
Washburn, Walter R.....	1st Lieut. and Asst. Surg.....	9th Infantry.....	July 2, 1898.....	M. O. May 29, '99.
Gregory, William G.....	1st Lieut. and Asst. Surg.....	9th Infantry.....	July 2, 1898.....	M. O. May 29, '99.

INDIANA.

Barnett, Walter W.....	Major and Surg.....	157th Infantry.....	May 11, 1898.....	M. O. Nov. 1, '98.
Barnett, Charles E.....	Captain and Asst. Surg.....	157th Infantry.....	May 4, 1898.....	M. O. Nov. 1, '98.
Garstang, Reginald W.....	1st Lieut. and Asst. Surg.....	157th Infantry.....	May 4, 1898.....	M. O. Nov. 1, '98.
Charlton, Frederick R.....	Major and Surg.....	158th Infantry.....	May 4, 1898.....	M. O. Nov. 4, '98.
Jones, Homer I.....	Captain and Asst. Surg.....	158th Infantry.....	May 4, 1898.....	M. O. Nov. 4, '98.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Barcus, Paul J.....	1st Lieut. and Asst. Surg.....	INDIANA.—Cont.		
Stunkard, Thomas C.....	Major and Surg.....	158th Infantry	May 4, 1898.....	M. O. Nov. 4, '98.
Hawkins, Eugene.....	Captain and Asst. Surg.....	159th Infantry	May 4, 1898.....	M. O. Nov. 23, '98.
Davis, William S.....	1st Lieut. and Asst. Surg.....	159th Infantry	May 4, 1898.....	M. O. Nov. 23, '98.
Kyle, John J.....	Major and Surg.....	160th Infantry	May 4, 1898.....	M. O. April 25, '99.
Foxworthy, Frank W.....	Captain and Asst. Surg.....	160th Infantry	May 4, 1898.....	M. O. April 25, '99.
Buchler, Eugene.....	1st Lieut. and Asst. Surg.....	160th Infantry	May 4, 1898.....	M. O. April 25, '99.
Smith, Wickliffe.....	Major and Surg.....	161st Infantry	June 23, 1898.....	M. O. April 30, '99.
Gerrish, Millard F.....	1st Lieut. and Asst. Surg.....	161st Infantry	June 23, 1898.....	M. O. April 30, '99.
Wilson, James.....	1st Lieut. and Asst. Surg.....	161st Infantry	June 23, 1898.....	M. O. April 30, '99.
Clarke, J Fred.....	Major and Surg.....	IOWA.		
Martindale, Edward L.....	1st Lieut. and Asst. Surg.....	49th Infantry	May 6, 1898.....	M. O. May 13, '99.
Hamilton, John.....	1st Lieut. and Asst. Surg.....	49th Infantry	May 6, 1898.....	M. O. May 13, '99.
Beeson, Edward G.....	1st Lieut. and Asst. Surg.....	49th Infantry	February 14, 1899.....	Resigned Feb. 13, '99.
Robertson, Charles M.....	Major and Surg.....	50th Infantry	May 6, 1898.....	M. O. May 13, '99.
Grant, Charles S.....	Major and Surg.....	50th Infantry		Appointed Chief Surgeon, U. S. Vols., July 22, '98.
Royle, Harlow A.....	1st Lieut. and Asst. Surg.....	50th Infantry	May 6, 1898.....	M. O. Nov. 30, '98.
Harriman, John W.....	Major and Surg.....	50th Infantry	August 23, 1898.....	M. O. Nov. 30, '98.
Pray, Gilbert L.....	1st Lieut. and Asst. Surg.....	50th Infantry	May 6, 1898.....	Resigned Sept. 1, '98.
Matthews, Willard S. H.....	Major and Surg.....	51st Infantry	August 2, 1898.....	M. O. Nov. 30, '98.
Fairchild, David S., Jr.....	Major and Surg.....	51st Infantry	May 6, 1898.....	Appointed Brigade Surgeon, Oct. 24, '98.
Macrae, Donald, Jr.....	1st Lieut. and Asst. Surg.....	51st Infantry	May 6, 1898.....	Still in service.
Conkling, Wilbur S.....	1st Lieut. and Asst. Surg.....	51st Infantry	March 3, 1899.....	Still in service.
Bergen, Andrew C.....	Major and Surg.....	52d Infantry	May 25, 1898.....	M. O. Oct. 30, '98.

IOWA.—Cont.						
Knott, Van Buren.....	1st Lieut. and Asst. Surg.....	52d Infantry.....	May 25, 1898.....	M. O. Oct. 30, '98.		
Murphy, Frank J.....	1st Lieut. and Asst. Surg.....	52d Infantry.....	May 25, 1898.....	M. O. Oct. 30, '98.		
KANSAS.						
Rafter, John A.....	Major and Surg.....	20th Infantry.....	May 13, 1898.....	Still in service.		
Huffman, Charles S.....	Asst. Surg.....	20th Infantry.....	May 13, 1898.....	Still in service.		
Smith, Henry D.....	Asst. Surg.....	20th Infantry.....	May 13, 1898.....	Still in service.		
Armstrong, Frank C.....	Major and Surg.....	21st Infantry.....	May 14, 1898.....	M. O. Dec. 10, '98.		
Biddle, Thomas C.....	Captain and Asst. Surg.....	21st Infantry.....	May 14, 1898.....	M. O. Dec. 10, '98.		
Turner, Frederick W.....	Captain and Asst. Surg.....	21st Infantry.....	May 14, 1898.....	M. O. Dec. 10, '98.		
Stewart, Josephus P.....	Major and Surg.....	22d Infantry.....	May 17, 1898.....	M. O. Nov. 3, '98.		
Duncan, Louis C.....	1st Lieut. and Asst. Surg.....	22d Infantry.....	May 17, 1898.....	M. O. Nov. 3, '98.		
de Niedman, Wladimir F.....	1st Lieut. and Asst. Surg.....	22d Infantry.....	May 17, 1898.....	M. O. July 15, '98, to accept commission as Major and Brigade Surgeon.		
Martin, Frank H.....	1st Lieut. and Asst. Surg.....	22d Infantry.....	July 16, 1898.....	M. O. Nov. 3, '98.		
Sunday, Charles S.....	1st Lieut. and Asst. Surg.....	23d Infantry.....	June 27, 1898.....	Resigned Dec. 24, '98.		
Harvey, Frederick D. G.....	1st Lieut. and Asst. Surg.....	23d Infantry.....	June 28, 1898.....	Resigned Dec. 24, '98.		
KENTUCKY.						
Palmer, Jack Brent.....	Major and Surg.....	1st Infantry.....	May 11, 1898.....	M. O. Feb. 24, '99.		
Duncan, Ellis.....	Asst. Surg.....	1st Infantry.....	May 11, 1898.....	Resigned Dec. 1, '98.		
Freeman, John K.....	Asst. Surg.....	1st Infantry.....	May 14, 1898.....	M. O. Feb. 24, '99.		
Dade, Walter H.....	Major and Surg.....	2d Infantry.....	May 9, 1898.....	M. O. Oct. 31, '98.		
Farmer, Charles.....	Captain and Asst. Surg.....	2d Infantry.....	May 9, 1898.....	M. O. Oct. 31, '98.		
Winn, Robert N.....	Captain and Asst. Surg.....	2d Infantry.....	May 9, 1898.....	M. O. Oct. 31, '98.		
Boyd, Frank.....	Major and Surg.....	3d Infantry.....	May 10, 1898.....	Resigned Nov. 20, '98.		
Bell, Austin.....	Major and Surg.....	3d Infantry.....	May 10, 1898.....	M. O. May 16, '99.		
Garrett, Nevil M.....	Captain and Asst. Surg.....	3d Infantry.....	May 10, 1898.....	M. O. May 16, '99.		
Atkinson, William T.....	Captain and Asst. Surg.....	3d Infantry.....	November 20, 1898.....	M. O. May 16, '99.		
Lewis, John C.....	1st Lieut. and Asst. Surg.....	4th Infantry.....	June 29, 1898.....	M. O. Feb. 12, '99.		
Kenyon, Frank P.....	Major and Surg.....	4th Infantry.....	June 28, 1898.....	M. O. Feb. 12, '99.		
Bruner, John C.....	1st Lieut. and Asst. Surg.....	4th Infantry.....	June 27, 1898.....	M. O. Feb. 12, '99.		
LOUISIANA.						
Artaud, Frank E.....	Major and Surg.....	1st Infantry.....	May 4, 1898.....	M. O. Oct. 3, '98.		
Blanchard, James A.....	Captain and Asst. Surg.....	1st Infantry.....	May 4, 1898.....	M. O. Oct. 3, '98.		

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
McGuire, Marion H.....	Captain and Asst. Surg.....	LOUISIANA.—Cont. 1st Infantry	May 4, 1898.....	M. O. Oct. 3, '98.
Archinard, John J.....	Major and Surg.....		May 4, 1898.....	Resigned Aug. 20, '98, to accept commission as Major and Brigade Surgeon.
Chalaron, Frank J.....	Major and Surg.....		May 4, 1898.....	M. O. April 18, '99.
Rainold, Mozart W.....	Captain and Asst. Surg.....		May 4, 1898.....	M. O. April 18, '99.
Jumel, Allen, Jr.....	1st Lieut. and Asst. Surg.....	2d Infantry	September 5, 1898.....	M. O. April 18, '99.
MAINE.				
Martin, Robert J.....	1st Lieut. and Asst. Surg.....	1st Battalion H'vy Artillery.	July 20, 1898.....	Resigned Oct. 28, '98.
Tukey, William H.....	1st Lieut. and Asst. Surg.....	1st Battalion H'vy Artillery.	November 15, 1898.....	M. O. March 31, '99.
Bradbury, Bial F.....	Major and Surg.....	1st Infantry	May 5, 1898.....	Appointed Brigade Surgeon, Aug. 22, '98.
O'Neill, James B.....	Major and Surg.....	1st Infantry	May 5, 1898.....	M. O. Oct. 30, '98.
Elliott, Gilbert M.....	1st Lieut. and Asst. Surg.....	1st Infantry	May 5, 1898.....	M. O. Oct. 30, '98.
Wheeler, Ernest H.....	1st Lieut. and Asst. Surg.....	1st Infantry	May 13, 1898.....	M. O. Oct. 30, '98.
MARYLAND.				
Claude, W. Clement.....	Major and Surg.....	1st Infantry	May 17, 1898.....	M. O. Feb. 28, '99.
de Krafft, S. Chase.....	Captain and Asst. Surg.....	1st Infantry	May 17, 1898.....	M. O. Feb. 28, '99.
Ullrich, Seth S.....	Captain and Asst. Surg.....	1st Infantry	June 29, 1898.....	Resigned Oct. 10, '98.
Hicks, George L.....	1st Lieut. and Asst. Surg.....	1st Infantry	November 7, 1898.....	M. O. Feb. 28, '99.
Jay, John G.....	Major and Surg.....	5th Infantry	May 14, 1898.....	M. O. Oct. 22, '98.
Davis, Samuel Griffith, Jr.....	Captain and Asst. Surg.....	5th Infantry	May 14, 1898.....	M. O. Oct. 22, '98.
Clark, Thaddeus W.....	Captain and Asst. Surg.....	5th Infantry	May 14, 1898.....	Absent at muster-out of Regt.
MASSACHUSETTS.				
Dearing, Howard S.....	Major and Surg.....	1st Heavy Artillery.....	May 9, 1898.....	M. O. Nov. 14, '98.

MASSACHUSETTS —Cont.			
Rolfe, William A.....	1st Lieut. and Asst. Surg.....	1st Heavy Artillery.....	May 9, 1898.....
Bryant, William S.....	1st Lieut. and Asst. Surg.....	1st Heavy Artillery.....	May 11, 1898.....
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Bowen, Henry C.....	Major and Surg.....	2d Infantry.....	May 4, 1898.....
Gates, Ernest A.....	Major and Surg.....	2d Infantry.....	May 4, 1898.....
Hitchcock, John S.....	1st Lieut. and Asst. Surg.....	2d Infantry.....	May 4, 1898.....
Foster, Charles C.....	Major and Surg.....	5th Infantry.....	June 20, 1898.....
Bateman, Frank E.....	1st Lieut. and Asst. Surg.....	5th Infantry.....	June 20, 1898.....
Pearl, Frederic W.....	Major and Surg.....	5th Infantry.....	June 20, 1898.....
McPherson, William E.....	1st Lieut. and Asst. Surg.....	5th Infantry.....	June 20, 1898.....
Barney, Charles N.....	1st Lieut. and Asst. Surg.....	5th Infantry.....	October 14, 1898.....
Marion, Otis H.....	Major and Surg.....	6th Infantry.....	May 4, 1898.....
Dow, George F.....	Major and Surg.....	6th Infantry.....	May 4, 1898.....
Washburn, Frederic A, Jr.....	1st Lieut. and Asst. Surg.....	6th Infantry.....	May 5, 1898.....
Gross, Herman W.....	1st Lieut. and Asst. Surg.....	6th Infantry.....	July 5, 1898.....
Cogswell, William.....	Major and Surg.....	8th Infantry.....	May 4, 1898.....
Jenkins, Thomas L.....	1st Lieut. and Asst. Surg.....	8th Infantry.....	May 5, 1898.....
Logan, Frank P. T.....	1st Lieut. and Asst. Surg.....	8th Infantry.....	May 4, 1898.....
Frost, Horace B.....	1st Lieut. and Asst. Surg.....	8th Infantry.....	September 15, 1898.....
Magurn, Francis T. L.....	Major and Surg.....	9th Infantry.....	May 4, 1898.....
Devine, William H.....	1st Lieut. and Asst. Surg.....	9th Infantry.....	May 8, 1898.....
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McGillicuddy, Cornelius J.....	1st Lieut. and Asst. Surg.....	9th Infantry.....	May 4, 1898.....
O'Shea, Peter.....	1st Lieut. and Asst. Surg.....	9th Infantry.....	June 24, 1898.....
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MICHIGAN.			
Biddle, Andrew P.....	Major and Surg.....	31st Infantry.....	May 5, 1898.....
Colby, Charles D. W.....	Major and Surg.....	31st Infantry.....	May 5, 1898.....
Owen, Frank W.....	Captain and Asst. Surg.....	31st Infantry.....	May 5, 1898.....
McLean, Allen D.....	1st Lieut. and Asst. Surg.....	31st Infantry.....	November 22, 1898.....
Knowles, Lawrence D.....	Major and Surg.....	32d Infantry.....	May 5, 1898.....
Burkart, John L.....	Asst. Surg.....	32d Infantry.....	May 5, 1898.....
Weed, O. B.....	Asst. Surg.....	32d Infantry.....	May 17, 1898.....

Resigned July 13, '98.
Appointed Brigade Surgeon
of Vols., with rank of Major,
Aug. 7, '98.
Died Aug. 13, '98.
M. O. Dec. 7, '98.
M. O. Jan. 23, '99.
Resigned Oct. 3, '98.
Resigned Oct. 13, '98.
M. O. March 31, '99.
M. O. March 31, '99.
M. O. March 31, '99.
Resigned June 23, '98.
M. O. Jan. 21, '99.
M. O. Jan. 21, '99.
M. O. Jan. 21, '99.
M. O. April 23, '99.
Resigned July 11, '98.
M. O. April 28, '99.
M. O. April 28, '99.
M. O. Jan. 23, '99.
Resigned June 7, '98, to accept
commission as Major
and Brigade Surgeon.
M. O. Nov. 26, '98.
M. O. Nov. 26, '98.

Resigned Sept. 15, '98.
M. O. May 17, '99.
M. O. May 17, '99.
M. O. May 17, '99.
M. O. May 17, '99.
M. O. Oct. 27, '98.
M. O. Oct. 27, '98.
M. O. Oct. 27, '98.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Nancrede, Charles B.	Major and Surg.	MICHIGAN.—Cont. 33d Infantry	May 11, 1898.	Appointed Brigade Surgeon June 8, '98.
Vaughan, Victor C.	Major and Surg.	33d Infantry	June 9, 1898.	Appointed Brigade Surgeon Aug. 30, '98.
Thomason, Henry D.	Major and Surg.	33d Infantry	July 27, 1898.	Absent on detached service at M. O. of Regt.
Bailey, Guy G.	1st Lieut. and Asst. Surg.	33d Infantry	May 11, 1898.	M. O. Dec. 31, '98.
Pease, Louis W.	1st Lieut. and Asst. Surg.	33d Infantry	May 15, 1898.	M. O. Dec. 31, '98.
King, James A.	Major and Surg.	34th Infantry	May 9, 1898.	M. O. Nov. 26, '98.
Bobb, John A.	1st Lieut. and Asst. Surg.	34th Infantry	May 9, 1898.	Died Aug. 19, '98.
Wilhelm, Julius M.	Captain and Asst. Surg.	34th Infantry	May 22, 1898.	M. O. Nov. 26, '98.
Carpenter, Gilbert V.	Captain and Asst. Surg.	31th Infantry	September 1, 1898.	M. O. Nov. 26, '98.
Barber, Oliver P.	Major and Surg.	35th Infantry	June 28, 1898.	Resigned Jan. 10, '99.
Grube, Howard A.	Major and Surg.	35th Infantry	June 23, 1898.	M. O. March 31, '99.
Sandall, Laurel B.	Captain and Asst. Surg.	35th Infantry	June 23, 1898.	M. O. March 31, '99.
Eber, Albert H.	1st Lieut. and Asst. Surg.	35th Infantry	January 27, 1899.	M. O. March 31, '99.
MINNESOTA.				
Clark, Thomas C.	Major and Surg.	12th Infantry	May 4, 1898.	M. O. Nov. 5, '98.
Caine, William H.	Captain and Asst. Surg.	12th Infantry	May 4, 1898.	M. O. Nov. 5, '98.
Rowe, William H.	1st Lieut. and Asst. Surg.	12th Infantry	May 4, 1898.	M. O. Nov. 5, '98.
Fitz Gerald, Reynaldo J.	Major and Surg.	13th Infantry	May 4, 1898.	Still in service.
Law, Arthur Ayer.	Captain and Asst. Surg.	13th Infantry	May 5, 1898.	Still in service.
Ritchie, Harry P.	1st Lieut. and Asst. Surg.	13th Infantry	May 5, 1898.	Still in service.
Cole, Alvinza B.	Major and Surg.	14th Infantry	May 4, 1898.	M. O. Nov. 18, '98.
Dutton, Charles E.	Captain and Asst. Surg.	14th Infantry	May 8, 1898.	M. O. Nov. 18, '98.
Dorsey, John H.	1st Lieut. and Asst. Surg.	14th Infantry	May 8, 1898.	M. O. Nov. 18, '98.
Dennis, Warren A.	Major and Surg.	15th Infantry	July 6, 1898.	M. O. March 27, '99.
Mowers, Saxe W.	Asst. Surg.	15th Infantry	July 5, 1898.	M. O. March 27, '99.

MINNESOTA.—Cont.				July 6, 1898.	M. O. March 27, '99.
Fry, Charles W.	Asst. Surg.	15th Infantry			
MISSISSIPPI.					
Turner, Robert Lee.	Major and Surg.	1st Infantry		May 12, 1898.	M. O. Dec. 20, '98.
Bauer, Henry L.	Captain and Asst. Surg.	1st Infantry		May 19, 1898.	M. O. Dec. 20, '98.
Kittrell, Benjamin H.	Asst. Surg.	1st Infantry		May 12, 1898.	Resigned Oct. 12, '98.
Sheppard, Francis M.	1st Lieut. and Asst. Surg.	2d Infantry		September 10, 1898.	M. O. Dec. 20, '98.
Hamilton, Madden W.	Major and Surg.	2d Infantry		May 23, 1898.	M. O. Dec. 20, '98.
Kent, Henry C.	Captain and Asst. Surg.	2d Infantry		May 18, 1898.	M. O. Dec. 20, '98.
Acker, George W.	1st Lieut. and Asst. Surg.	2d Infantry		May 19, 1898.	Resigned Jan. 28, '99.
Humphreys, David S.	1st Lieut. and Asst. Surg.	3d Infantry		July 11, 1898.	Resigned Nov. 7, '98.
Seale, Robert A.	1st Lieut. and Asst. Surg.	3d Infantry		August 6, 1898.	M. O. March 17, '99.
Anderson, Robert A.	1st Lieut. and Asst. Surg.	3d Infantry		December 1, 1898.	M. O. March 17, '99.
MISSOURI.					
Hereford, John R.	Major and Surgeon.	1st Infantry		June 28, 1898.	M. O. Oct. 31, '98.
Welch, Thomas P.	1st Lieut. and Asst. Surg.	1st Infantry		May 13, 1898.	M. O. Oct. 31, '98.
Holland, James S.	1st Lieut. and Asst. Surg.	1st Infantry		May 30, 1898.	M. O. Oct. 31, '98.
Crawford, Samuel K.	Major and Surg.	2d Infantry		May 24, 1898.	M. O. March 3, '99.
Stearns, Charles H.	1st Lieut. and Asst. Surg.	2d Infantry		May 9, 1898.	M. O. March 3, '99.
Rutherford, H. H.	1st Lieut. and Asst. Surg.	2d Infantry		July 22, 1898.	M. O. March 3, '99.
Jackson, Jabez N.	Major and Surg.	3d Infantry		May 9, 1898.	Resigned July 27, '98.
Wilson, Charles E.	Major and Surg.	3d Infantry		May 9, 1898.	M. O. Nov. 7, '98.
Kneedler, Harry D.	Captain and Asst. Surg.	3d Infantry		May 25, 1898.	Promoted Major and Surgeon and transferred to 4 Mo. V. I.
Jackson, Walter E.	Captain and Asst. Surg.	3d Infantry		July 18, 1898.	M. O. Nov. 7, '98.
O'Reilly, Thomas W.	Captain and Asst. Surg.	3d Infantry		July 20, 1898.	M. O. Nov. 7, '98.
McArthur, Arthur W.	Asst. Surg.	4th Infantry		May 16, 1898.	M. O. Feb. 10, '99.
Whittington, William L.	Asst. Surg.	4th Infantry		May 16, 1898.	M. O. Feb. 10, '99.
Kneedler, Harry D.	Major and Surg.	4th Infantry		May 25, 1898.	M. O. Feb. 10, '99.
Harrison, Nathan O.	Major and Surg.	5th Infantry		May 18, 1898.	M. O. Nov. 9, '98.
Newberry, Frank R.	1st Lieut. and Asst. Surg.	5th Infantry		May 18, 1898.	Resigned Sept. 10, '98.
Burchard, Easton.	1st Lieut. and Asst. Surg.	5th Infantry		May 18, 1898.	M. O. Nov. 9, '98.
McCallum, Francis M.	1st Lieut. and Asst. Surg.	5th Infantry		October 7, 1898, to date September 16, 1898.	M. O. Nov. 9, '98.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Bauduy, Keating.....	Major and Surg.....	MISSOURI—Cont. 6th Infantry	July 15, 1898.....	Resigned Dec. 31, '98.
Lieberman, B. Albert.....	Major and Surg.....		July 19, 1898.....	M. O. May 10, '99.
Grantham, Samuel A.....	1st Lieut. and Asst. Surg.....		August 1, 1898.....	M. O. May 10, '99.
Murray, Wilson.....	1st Lieut. and Asst. Surg.....		January 1, 1899.....	M. O. May 10, '99.
Adams, Francis J.....	Major and Surg.....	MONTANA. 1st Infantry	May 5, 1898.....	Still in service.
Bruning, Lon C.....	1st Lieut. and Asst. Surg.....		May 5, 1898.....	Still in service.
Southmayd, Le Roy.....	1st Lieut. and Asst. Surg.....		May 8, 1898.....	Still in service.
Snyder, Frank A.....	Major and Surg.....	NEBRASKA. 1st Infantry	May 10, 1898.....	Still in service.
Mullins, Charles L.....	Captain and Asst. Surg.....		May 10, 1898.....	M. O. Feb. 24, '99.
Jensen, Robert P.....	1st Lieut. and Asst. Surg.....		May 10, 1898.....	Resigned June 1, '99.
Talbot, Willis E.....	1st Lieut. and Asst. Surg.....		February 17, 1899.....	Still in service.
Hoover, Maurice A.....	Major and Surg.....		May 4, 1898.....	M. O. Oct. 24, '98.
Rebert, Michael A.....	Captain and Asst. Surg.....		May 10, 1898.....	M. O. Oct. 24, '98.
Marron, James G.....	1st Lieut. and Asst. Surg.....		May 6, 1898.....	M. O. Oct. 24, '98.
Grothan, Ole.....	Major and Surg.....		June 25, 1898.....	M. O. May 11, '99.
Irwin, Ralph J.....	Captain and Asst. Surg.....		June 23, 1898.....	M. O. May 11, '99.
Fitzsimmons, Albert P.....	1st Lieut. and Asst. Surg.....		June 23, 1898.....	M. O. May 11, '99.
Pinniger, Sidney E. D.....	1st Lieut. and Asst. Surg.....	NEVADA. 1st Battalion Infantry.....	July 11, 1898.....	M. O. Oct. 29, '98.
Burns, Robert.....	Major and Surg.....	NEW HAMPSHIRE. 1st Infantry	May 7, 1898.....	Resigned Oct. 11, '98.
Day, Arthur K.....	1st Lieut. and Asst. Surg.....		May 10, 1898.....	Resigned Aug. 30, '98.
Greeley, James T.....	Major and Surg.....		May 9, 1898.....	M. O. Oct. 31, '98.

NEW HAMPSHIRE—Cont.					
Congdon, Charles E.	1st Lieut. and Asst. Surg.	1st Infantry	September 23, 1898.	M. O. Oct. 31, '98.	
Wilkins, Russell.	1st Lieut. and Asst. Surg.	1st Infantry	October 19, 1898.	M. O. Oct. 31, '98.	
NEW JERSEY.					
Allers, Henry.	Major and Surg.	1st Infantry	May 3, 1898.	M. O. Nov. 4, '98.	
English, James R., Jr.	1st Lieut. and Asst. Surg.	1st Infantry	May 3, 1898.	M. O. Nov. 4, '98.	
Baldwin, S. Harbourn.	1st Lieut. and Asst. Surg.	1st Infantry	May 3, 1898.	M. O. Nov. 4, '98.	
Patterson, Horace Wilbur.	1st Lieut. and Asst. Surg.	1st Infantry	May 14, 1898.	M. O. Nov. 4, '98.	
Adams, Charles F.	Major and Surg.	2d Infantry	May 15, 1898.	M. O. Nov. 17, '98.	
Blundell, Charles R.	1st Lieut. and Asst. Surg.	2d Infantry	May 12, 1898.	M. O. Nov. 17, '98.	
Terriberry, William S.	1st Lieut. and Asst. Surg.	2d Infantry	May 15, 1898.	Resigned Sept. 30, '98.	
Brien, William Miller.	1st Lieut. and Asst. Surg.	2d Infantry	May 12, 1898.	M. O. Nov. 17, '98.	
Slack, Clarence M.	Major and Surg.	3d Infantry	May 10, 1898.	M. O. Feb. 11, '99.	
McWilliam, John F.	1st Lieut. and Asst. Surg.	3d Infantry	May 12, 1898.	M. O. Feb. 11, '99.	
Keefe, Stephen J.	1st Lieut. and Asst. Surg.	3d Infantry	May 11, 1898.	Resigned Oct. 20, '98.	
Schlichter, Charles H.	1st Lieut. and Asst. Surg.	3d Infantry	May 17, 1898.	Resigned Oct. 15, '98.	
Gray, John W.	1st Lieut. and Asst. Surg.	3d Infantry	December 23, 1898.	M. O. Feb. 11, '99.	
Field, Edwin.	Major and Surg.	4th Infantry	July 7, 1898.	M. O. April 6, '99.	
Broderick, John J.	1st Lieut. and Asst. Surg.	4th Infantry	July 7, 1898.	Resigned Sept. 14, '98.	
Mcraay, Paul M.	1st Lieut. and Asst. Surg.	4th Infantry	July 7, 1898.	Resigned Dec. 8, '98.	
Fithian, Joel W.	1st Lieut. and Asst. Surg.	4th Infantry	July 17, 1898.	M. O. April 6, '99.	
Gray, John W.	1st Lieut. and Asst. Surg.	4th Infantry	March 1, 1899.	M. O. April 6, '99.	
NEW YORK.					
Davis, Charles E.	Major and Surg.	1st Infantry	May 6, 1898.	M. O. Feb. 20, '99.	
Ramsey, George D.	1st Lieut. and Asst. Surg.	1st Infantry	May 6, 1898.	Appointed Major and Surgeon, 69th N. Y. V. I.	
Ashley, Maurice C.	1st Lieut. and Asst. Surg.	1st Infantry	May 17, 1898.	M. O. Feb. 20, '99.	
Griffith, Lewis E.	1st Lieut. and Asst. Surg.	1st Infantry	May 20, 1898.	M. O. Feb. 20, '99.	
Balch, Lewis.	Major and Surg.	2d Infantry	May 6, 1898.	Resigned Nov. 2, '98.	
Baum, Henry C.	Captain and Asst. Surg.	2d Infantry	May 5, 1898.	M. O. Dec. 13, '98.	
Bugman, Albert F.	Captain and Asst. Surg.	2d Infantry	May 16, 1898.	M. O. Dec. 10, '98.	
Bemus, William M.	Major and Surg.	3d Infantry	May 6, 1898.	Absent at muster-out of Regt.	
Hodgman, Alfred F.	1st Lieut. and Asst. Surg.	3d Infantry	May 6, 1898.	M. O. Dec. 10, '98, to date.	
				Nov. 30, '98.	

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Howland, Reeve B.....	1st Lieut. and Asst. Surg.....	NEW YORK.—Cont. 3d Infantry	May 6, 18'8.	M. O. Dec. 10, '98, to date Nov. 30, '98.
Neff, Lewis K.....	Major and Surg.....	8th Infantry	May 6, 1898.	M. O. Nov. 3, '98.
Steele, Whitmore.....	1st Lieut. and Asst. Surg.....	8th Infantry	May 6, 1898.	Resigned June 10, '98.
Haubold, Herman A.....	1st Lieut. and Asst. Surg.....	8th Infantry	May 6, 1898.	M. O. Nov. 3, '98.
Lindheim, George.....	1st Lieut. and Asst. Surg.....	8th Infantry	May 17, 1898.	Died Sept. 16, '98.
Hubbard, Samuel D.....	Major and Surg.....	9th Infantry	May 7, 1898.	M. O. Jan. 4, '99, to date Nov. 15, '98.
Hommedieu, John B. L.....	1st Lieut. and Asst. Surg.....	9th Infantry	May 7, 1898.	Resigned Sept. 17, '98.
Preston, Albert W.....	1st Lieut. and Asst. Surg.....	9th Infantry	May 15, 1898.	M. O. Nov. 15, '98.
Ward, George G., Jr.....	Major and Surg.....	12th Infantry	May 6, 1898.	Resigned Sept. 8, '98.
Haden, John B.....	1st Lieut. and Asst. Surg.....	12th Infantry	May 6, 1898.	Resigned Aug. 29, '98.
Chalmers, Thomas C.....	Major and Surg.....	12th Infantry	May 6, 1898.	M. O. April 20, '99.
De Muth, Jesse S.....	1st Lieut. and Asst. Surg.....	12th Infantry	May 13, 1898.	M. O. April 20, '99.
McCleave, Thomas C.....	1st Lieut. and Asst. Surg.....	12th Infantry	December 5, 1898.	M. O. April 20, '99.
Macumber, John L.....	Major and Surg.....	14th Infantry	May 4, 1898.	M. O. Aug. 25, '98.
Bogart, Arthur H.....	Major and Surg.....	14th Infantry	May 4, 1898.	M. O. Nov. 1, '98, as of the date of Oct. 27, '98.
Spence, Thomas B.....	Asst. Surg.....	14th Infantry	May 4, 1898.	M. O. Nov. 1, '98, as of the date of Oct. 27, '98.
Wilson, John S.....	Major and Surg.....	22d Infantry	May 3, 1898.	M. O. Nov. 23, '98.
Johnston, William C.....	Captain and Asst. Surg.....	22d Infantry	May 19, 1898.	M. O. Nov. 23, '98.
Jarrett, Arthur R.....	Captain and Asst. Surg.....	22d Infantry	May 17, 1898.	M. O. Nov. 23, '98.
Wallace, Henry.....	Major and Surg.....	47th Infantry	May 6, 1898.	Resigned Sept. 13, '98.
Gibbons, John T.....	Major and Surg.....	47th Infantry	May 6, 1898.	M. O. March 31, '99.
Bowen, Edward N.....	Captain and Asst. Surg.....	47th Infantry	May 6, 1898.	M. O. March 31, '99.
Hodges, Edward.....	Captain and Asst. Surg.....	47th Infantry	December 10, 1898.	M. O. March 31, '99.
Briggs, Albert H.....	Major and Surg.....	65th Infantry	May 17, 1898.	M. O. Nov. 19, '98.
Mead, Harry.....	1st Lieut. and Asst. Surg.....	65th Infantry	May 17, 1898.	M. O. Nov. 19, '98.

NEW YORK.—Cont.

Rufner, Ernest L.....	1st Lieut. and Asst. Surg.....	65th Infantry	May 17, 1898.....	M. O. Nov. 19, '98.
Ramsay, George W.....	Major and Surg.....	69th Infantry	May 19, 1898.....	Resigned July 18, '98.
Oswald, Francis L.....	Major and Surg.....	69th Infantry	May 6, 1898.....	M. O. Jan. 31, '99.
Fuchsius, John H.....	Captain and Asst. Surg.....	69th Infantry	May 16, 1898.....	M. O. Jan. 31, '99.
Daley, Robert M.....	1st Lieut. and Asst. Surg.....	69th Infantry	August 15, 1898.....	M. O. Jan. 31, '99.
Bell, William D.....	Major and Surg.....	71st Infantry	May 2, 1898.....	M. O. Nov. 15, '98.
Stafford, Harry E.....	Captain and Asst. Surg.....	71st Infantry	May 2, 1898.....	M. O. Nov. 15, '98.
Stafford, James.....	Captain and Asst. Surg.....	71st Infantry	May 2, 1898.....	M. O. Nov. 15, '98.
Spencer, William E.....	Major and Surg.....	201st Infantry	July 2, 1898.....	M. O. April 3, '99.
Poucher, John William.....	1st Lieut. and Asst. Surg.....	201st Infantry	July 5, 1898.....	Resigned Oct. 10, '98.
Graves, Leonard K.....	1st Lieut. and Asst. Surg.....	201st Infantry	July 2, 1898.....	M. O. April 3, '99.
Burr, Daniel S.....	Major and Surg.....	202d Infantry	July 5, 1898.....	M. O. April 15, '99.
Wood, James.....	1st Lieut. and Asst. Surg.....	202d Infantry	July 5, 1898.....	Died March 3, '99.
Clinton, Marshall.....	1st Lieut. and Asst. Surg.....	202d Infantry	July 1, 1898.....	M. O. April 15, '99.
Tetamore, Frank L. R.....	1st Lieut. and Asst. Surg.....	202d Infantry	April 6, 1899.....	M. O. April 15, '99.
Booth, Burton S.....	Major and Surg.....	203d Infantry	July 4, 1898.....	Resigned Dec. 1, '98.
Haines, Abram L.....	Major and Surg.....	203d Infantry	July 5, 1898.....	M. O. March 25, '99.
Burgess, William A.....	1st Lieut. and Asst. Surg.....	203d Infantry	July 5, 1898.....	M. O. March 25, '99.
Dolphin, Percival F.....	1st Lieut. and Asst. Surg.....	203d Infantry	July 24, 1898.....	M. O. March 25, '99.

NORTH CAROLINA.

Wilder, Hillary M.....	Major and Surg.....	1st Infantry	May 3, 1898.....	M. O. April 22, '99.
Jordan, Charles S.....	Captain and Asst. Surg.....	1st Infantry	May 3, 1898.....	Resigned Nov. 10, '98.
Archey, Leona M.....	1st Lieut. and Asst. Surg.....	1st Infantry	May 3, 1898.....	Resigned Feb. 25, '99.
Hunter, Baxter R.....	Captain and Asst. Surg.....	1st Infantry	December 7, 1898.....	M. O. April 22, '99.
Lee, Richard E.....	1st Lieut. and Asst. Surg.....	1st Infantry	February 26, 1899.....	M. O. April 22, '99.
Stockard, James K.....	Major and Surg.....	2d Infantry	May 25, 1898.....	M. O. Nov. 26, '98.
Brevard, Ephraim M.....	Captain and Asst. Surg.....	2d Infantry	May 25, 1898.....	M. O. Nov. 25, '98.
Brooks, William H.....	1st Lieut. and Asst. Surg.....	2d Infantry	May 28, 1898.....	M. O. Nov. 25, '98.
Dellinger, James E.....	Major and Surg.....	3d Infantry	July 3, 1898.....	M. O. Feb. 8, '99.
Pope, Manassa T.....	1st Lieut. and Asst. Surg.....	3d Infantry	July 4, 1898.....	M. O. Feb. 8, '99.
Mask, Thomas R.....	1st Lieut. and Asst. Surg.....	3d Infantry	May 12, 1898.....	Resigned Aug. 1, '98.
Alston, Marcus W.....	1st Lieut. and Asst. Surg.....	3d Infantry	August 24, 1898.....	M. O. Feb. 8, '99.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Pease, Frank D.....	Major and Surg.....	NORTH DAKOTA.	May 18, 1898.....	Still in service.
Black, Nelson M.....	Captain and Asst. Surg.....	1st Infantry	May 18, 1898.....	Still in service.
		OHIO.		
Bunts, Frank E.....	Major and Surg.....	1st Cavalry	May 9, 1898.....	M. O. Oct. 22, '98.
Castle, Charles H.....	Captain and Asst. Surg.....	1st Cavalry	May 9, 1898.....	M. O. Oct. 22, '98.
Moore, Henry M. W.....	Major and Surg.....	1st Battalion Lt. Artillery.....	May 11, 1898.....	M. O. Oct. 21, '98.
Hendley, Frank W.....	Major and Surg.....	1st Infantry	May 6, 1898.....	M. O. Oct. 25, '98.
Cullen, Gilbert I.....	Captain and Asst. Surg.....	1st Infantry	May 6, 1898.....	M. O. Jan. 22, '99.
Twitchell, Herbert E.....	Captain and Asst. Surg.....	1st Infantry	May 6, 1898.....	M. O. Oct. 25, '98.
Bain, Frank D.....	Major and Surg.....	2d Infantry	May 10, 1898.....	M. O. Feb. 10, '99.
Mueller, Charles L.....	Captain and Asst. Surg.....	2d Infantry	May 10, 1898.....	M. O. Feb. 10, '99.
Stueber, Louis J.....	Captain and Asst. Surg.....	2d Infantry	May 10, 1898.....	M. O. Feb. 10, '99.
Shellenberger, James E.....	Major and Surg.....	3d Infantry	May 11, 1898.....	M. O. Oct. 26, '98.
Weaver, Fred C.....	Captain and Asst. Surg.....	3d Infantry	May 10, 1898.....	M. O. Oct. 26, '98.
Gotwald, David King.....	Captain and Asst. Surg.....	3d Infantry	May 10, 1898.....	M. O. Oct. 26, '98.
Semans, Edward M.....	Major and Surg.....	4th Infantry	May 9, 1898.....	M. O. Jan. 20, '99.
Wright, Thompson B.....	Captain and Asst. Surg.....	4th Infantry	May 9, 1898.....	M. O. Jan. 20, '99.
Taylor, Henry M.....	Captain and Asst. Surg.....	4th Infantry	May 9, 1898.....	M. O. Jan. 20, '99.
Love, William P.....	Major and Surg.....	5th Infantry	May 11, 1898.....	M. O. Nov. 5, '98.
Windisch, John S.....	Captain and Asst. Surg.....	5th Infantry	May 11, 1898.....	M. O. Nov. 5, '98.
Noble, Charles D.....	Captain and Asst. Surg.....	5th Infantry	May 11, 1898.....	M. O. Nov. 5, '98.
Osborn, Arthur L.....	Major and Surg.....	6th Infantry	May 12, 1898.....	Resigned July 7, '98.
Myers, Park L.....	Major and Surg.....	6th Infantry	May 12, 1898.....	M. O. May 24, '99.
Howe, John D.....	Captain and Asst. Surg.....	6th Infantry	May 12, 1898.....	M. O. May 24, '99.
Albritton, Fred L.....	1st Lieut. and Asst. Surg.....	6th Infantry	July 20, 1898.....	Resigned Dec. 13, '98.
Moor, Daniel C.....	1st Lieut. and Asst. Surg.....	6th Infantry	December 4, 1898.....	Resigned April 13, '99.
Rannells, David A.....	Major and Surg.....	7th Infantry	May 13, 1898.....	M. O. Nov. 6, '98.
Bonar, Reuben M.....	Captain and Asst. Surg.....	7th Infantry	May 13, 1898.....	M. O. Nov. 10, '98.

OHIO.—Cont.				
Waddle, Edward F.	Captain and Asst. Surg.	7th Infantry	May 13, 1898.	M. O. Nov. 6, '98.
Farquhar, Emmer C.	Major and Surg.	8th Infantry	May 13, 1898.	Died Sept. 17, '98.
Wuchter, George H.	Captain and Asst. Surg.	8th Infantry	May 13, 1898.	M. O. Nov. 21, '98.
Smith, Allen V.	Captain and Asst. Surg.	8th Infantry	May 13, 1898.	M. O. Nov. 21, '98.
Hobbs, Wilbert A.	Major and Surg.	8th Infantry	November 9, 1898.	M. O. Nov. 21, '98.
Dickerson, John H.	Captain and Asst. Surg.	9th Infantry	May 14, 1898.	Resigned Aug. 8, '98.
Wren, William Guy.	1st Lieut. and Asst. Surg.	9th Infantry	August 19, 1898.	M. O. Jan. 28, '99.
Westervelt, William A.	Major and Surg.	10th Infantry	June 29, 1898.	M. O. March 23, '99.
Newton, Charles W.	1st Lieut. and Asst. Surg.	10th Infantry	June 29, 1898.	Resigned Oct. 16, '98.
Erwin, James J.	1st Lieut. and Asst. Surg.	10th Infantry	June 29, 1898.	M. O. March 23, '99.
Jones, George H.	1st Lieut. and Asst. Surg.	10th Infantry	November 26, 1898.	M. O. March 23, '99.
OREGON.				
Ellis, Mathew H.	Major and Surg.	2d Infantry	May 4, 1898.	Still in service.
Cardwell, Herbert W.	Captain and Asst. Surg.	2d Infantry	May 8, 1898.	Appointed Major and Chief Surgeon, U. S. Vols., May 26, '98.
Whiting, Sandford.	Captain and Asst. Surg.	2d Infantry	May 10, 1898.	Still in service.
PENNSYLVANIA.				
Smith, Lawrence S.	Major and Surg.	1st Infantry	May 5, 1898.	Died Aug. 15, '98.
Harland, William G. B.	Major and Surg.	1st Infantry	May 5, 1898.	M. O. Oct. 26, '98.
Tunis, Joseph P.	1st Lieut. and Asst. Surg.	1st Infantry	May 5, 1898.	M. O. Oct. 26, '98.
Burgin, Herman.	Major and Surg.	2d Infantry	May 13, 1898.	M. O. Nov. 15, '98.
Packard, Francis R.	1st Lieut. and Asst. Surg.	2d Infantry	May 13, 1898.	Resigned Oct. 25, '98.
Robins, Robert P.	1st Lieut. and Asst. Surg.	2d Infantry	May 13, 1898.	M. O. Nov. 15, '98.
Martin, Edward.	Major and Surg.	3d Infantry	May 5, 1898.	Appointed Brigade Surgeon July 15, '98.
Bauman, Joseph W.	1st Lieut. and Asst. Surg.	3d Infantry	May 5, 1898.	M. O. Oct. 22, '98.
Patterson, Francis D.	1st Lieut. and Asst. Surg.	3d Infantry	May 5, 1898.	M. O. Oct. 22, '98.
Thompson, Archibald G.	Major and Surg.	3d Infantry	July 8, 1898.	M. O. Oct. 22, '98.
Potteiger, John B.	Major and Surg.	4th Infantry	May 5, 1898.	Resigned May 12, '98.
Cawley, Morris F.	Major and Surg.	4th Infantry	May 5, 1898.	M. O. Nov. 16, '98.
Gloninger, Andrew B.	1st Lieut. and Asst. Surg.	4th Infantry	May 5, 1898.	M. O. Nov. 16, '98.
Potteiger, John B.	1st Lieut. and Asst. Surg.	4th Infantry	May 12, 1898.	M. O. Nov. 16, '98.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
PENNSYLVANIA. — Cont.				
Stayer, Andrew S.	Major and Surg.	5th Infantry	May 5, 1898.	M. O. Nov. 7, '98.
Hayes, Robert G. H.	1st Lieut. and Asst. Surg.	5th Infantry	May 5, 1898.	M. O. Nov. 7, '98.
Glover, Samuel P.	1st Lieut. and Asst. Surg.	5th Infantry	May 11, 1898.	M. O. Nov. 7, '98.
Ashenfelter, William J.	Major and Surg.	6th Infantry	May 5, 1898.	M. O. Oct. 17, '98.
Ward, John M. B.	1st Lieut. and Asst. Surg.	6th Infantry	May 5, 1898.	M. O. Oct. 17, '98.
Fitzpatrick, Charles.	1st Lieut. and Asst. Surg.	6th Infantry	May 5, 1898.	M. O. Oct. 17, '98.
Janss, Christian E.	Major and Surg.	8th Infantry	May 5, 1898.	M. O. March 7, '99.
Reilly, William F.	1st Lieut. and Asst. Surg.	8th Infantry	May 5, 1898.	Resigned May 5, '98.
Montelius, Ralph W.	1st Lieut. and Asst. Surg.	8th Infantry	May 5, 1898.	M. O. March 7, '99.
Da Costa, John C., Jr.	1st Lieut. and Asst. Surg.	8th Infantry	June 6, 1898.	M. O. March 7, '99.
Stewart, Walter S.	Major and Surg.	9th Infantry	May 5, 1898.	M. O. Oct. 29, '98.
Weaver, William G.	1st Lieut. and Asst. Surg.	9th Infantry	May 5, 1898.	Resigned Aug. 31, '98.
Miner, Charles H.	1st Lieut. and Asst. Surg.	9th Infantry	May 5, 1898.	M. O. Oct. 29, '98.
Grosser, Claude R.	1st Lieut. and Asst. Surg.	9th Infantry	May 11, 1898.	M. O. Oct. 29, '98.
Neff, George W.	Major and Surg.	10th Infantry	May 5, 1898.	Still in service.
McCormick, Lewis P.	1st Lieut. and Asst. Surg.	10th Infantry	May 5, 1898.	Still in service.
Coffin, John W.	1st Lieut. and Asst. Surg.	10th Infantry	May 5, 1898.	Resigned June 6, '99.
Focht, Martin L.	Major and Surg.	12th Infantry	May 5, 1898.	M. O. Oct. 29, '98.
Reifsnyder, Joseph C.	1st Lieut. and Asst. Surg.	12th Infantry	May 5, 1898.	M. O. Oct. 29, '98.
Hull, Waldo W.	1st Lieut. and Asst. Surg.	12th Infantry	May 5, 1898.	M. O. Oct. 29, '98.
Parke, Charles R.	Major and Surg.	13th Infantry	May 5, 1898.	Appointed Brigade Surgeon July 16, '98.
Keller, William E.	Major and Surg.	13th Infantry	May 5, 1898.	M. O. March 11, '99.
Blanchard, George A.	1st Lieut. and Asst. Surg.	13th Infantry	May 5, 1898.	M. O. March 11, '99.
Merriman, George Coe.	1st Lieut. and Asst. Surg.	13th Infantry	May 13, 1898.	M. O. March 11, '99.
Johnston, William McC.	Major and Surg.	14th Infantry	May 5, 1898.	Resigned Oct. 21, '98.
Emmerling, Karl A.	1st Lieut. and Asst. Surg.	14th Infantry	May 5, 1898.	Resigned Oct. 19, '98.
Srodes, James L.	Major and Surg.	14th Infantry	May 5, 1898.	Resigned Jan. 17, '99.
Hill, John S.	1st Lieut. and Asst. Surg.	14th Infantry	November 7, 1898.	M. O. Feb. 28, '99.

LIST OF MEDICAL OFFICERS, Etc.—Continued.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
TENNESSEE—Cont.				
Smith, Reynold M. Kirby...	Captain and Asst. Surg.	1st Infantry	May 19, 1898.	Still in service.
Summers, Thomas Osmond.	Major and Surg.	2d Infantry	May 3, 1898.	Resigned Oct. 5, '98.
Seay, George W., Jr.	Major and Surg.	2d Infantry	May 3, 1898.	M. O. Feb. 8, '99.
Hall, Dupree M.	Captain and Asst. Surg.	2d Infantry	May 24, 1898.	M. O. Feb. 8, '99.
Porter, George L.	Captain and Asst. Surg.	2d Infantry	May 23, 1898.	M. O. Feb. 8, '99.
Bowen, William.	Major and Surg.	3d Infantry	May 5, 1898.	M. O. Jan. 31, '99.
Ellis, George Manning.	Captain and Asst. Surg.	3d Infantry	May 5, 1898.	Resigned Nov. 1, '98.
Roberts, George W.	Captain and Asst. Surg.	3d Infantry	June 11, 1898.	M. O. Jan. 31, '99.
Pierce, Claude C.	1st Lieut. and Asst. Surg.	3d Infantry	November 14, 1898.	M. O. Jan. 31, '99.
Epler, J. Crum.	Major and Surg.	4th Infantry	June 27, 1898.	M. O. May 6, '99.
McDonald, Joseph W.	1st Lieut. and Asst. Surg.	4th Infantry	July 1, 1898.	M. O. May 6, '99.
Earthman, Vernon K. S.	1st Lieut. and Asst. Surg.	4th Infantry	July 1, 1898.	M. O. May 6, '99.
TEXAS.				
Hadra Frederick.	Major and Surg.	1st Cavalry	May 15, 1898.	M. O. Nov. 14, '98.
McClenohan, Henry C.	1st Lieut. and Asst. Surg.	1st Cavalry	May 15, 1898.	M. O. Nov. 14, '98.
Nicholson, Richard E.	1st Lieut. and Asst. Surg.	1st Cavalry	May 15, 1898.	M. O. Nov. 14, '98.
Vilas, Walter N.	Major and Surg.	1st Infantry	May 12, 1898.	Resigned Oct. 25, '98.
Gannon, William.	Captain and Asst. Surg.	1st Infantry	May 12, 1898.	Resigned Oct. 26, '98.
Kennedy, Alvis B.	Major and Surg.	1st Infantry	May 12, 1898.	M. O. April 18, '99.
Jackson, Thomas T.	1st Lieut. and Asst. Surg.	1st Infantry	November 2, 1898.	M. O. April 18, '99.
Hogg, Frank B.	1st Lieut. and Asst. Surg.	1st Infantry	December 16, 1898.	M. O. April 18, '99.
Peeples, Darling L.	Major and Surg.	2d Infantry	May 7, 1898.	M. O. Nov. 9, '98.
Jackson, Thomas T.	1st Lieut. and Asst. Surg.	2d Infantry	May 8, 1898.	Resigned Nov. 1, '98.
McLaughlin, Wharton B.	1st Lieut. and Asst. Surg.	2d Infantry	May 9, 1898.	M. O. Nov. 9, '98.
Taylor, Hugh L.	Major and Surg.	3d Infantry	May 8, 1898.	M. O. Feb. 22, '99.
Sims, George W.	1st Lieut. and Asst. Surg.	3d Infantry	May 6, 1898.	M. O. Feb. 22, '99.
Davidson, Wilson T.	1st Lieut. and Asst. Surg.	3d Infantry	May 9, 1898.	M. O. Feb. 22, '99.
Shaw, Edward N.	Major and Surg.	4th Infantry	July 1, 1898.	M. O. March 10, '99.

TEXAS.—Cont.					
Smyth, Thomas F.	1st Lieut. and Asst. Surg.	4th Infantry	July 1, 1898.	.....	M. O. March 10, '99.
Halsell, John T.	1st Lieut. and Asst. Surg.	4th Infantry	July 1, 1898.	.....	M. O. March 10, '99.
VERMONT.					Appointed Brigade Surgeon Aug. 16, '98.
Lee, Henry H.	Major and Surg.	1st Infantry	May 3, 1898.	.....
Hamilton, James M.	Major and Surg.	1st Infantry	May 3, 1898.	.....	M. O. Nov. 7, '98.
Jackson, Joseph W.	1st Lieut. and Asst. Surg.	1st Infantry	May 7, 1898.	.....	M. O. Nov. 7, '98.
Anderson, George R.	1st Lieut. and Asst. Surg.	1st Infantry	August 17, 1898.	.....	M. O. Nov. 7, '98.
VIRGINIA.					
Peyton, Charles E. C.	Major and Surg.	2d Infantry	May 4, 1898.	.....	M. O. Dec. 16, '98.
Simmons, Richard G.	Captain and Asst. Surg.	2d Infantry	May 4, 1898.	.....	M. O. Dec. 16, '98.
Caldwell, Robert E.	Captain and Asst. Surg.	2d Infantry	May 4, 1898.	.....	M. O. Dec. 11, '98.
Smith, William M.	Major and Surg.	3d Infantry	May 4, 1898.	.....	M. O. Nov. 5, '98.
Anderson, William E.	Captain and Asst. Surg.	3d Infantry	May 4, 1898.	.....	M. O. Nov. 5, '98.
Camm, Frank.	Captain and Asst. Surg.	3d Infantry	May 4, 1898.	.....	M. O. Nov. 5, '98.
Vance, Charles R.	Major and Surg.	4th Infantry	May 5, 1898.	.....	M. O. April 27, '99.
Peed, George P.	Captain and Asst. Surg.	4th Infantry	May 5, 1898.	.....	M. O. April 27, '99.
Old, William M.	Captain and Asst. Surg.	4th Infantry	May 6, 1898.	.....	M. O. April 27, '99.
Alexander, Charles R.	1st Lieut. and Asst. Surg.	6th Infantry	June 25, 1898.	.....	M. O. Jan. 28, '99.
Black, Allen J.	1st Lieut. and Asst. Surg.	6th Infantry	July 13, 1898.	.....	M. O. Jan. 28, '99.
WASHINGTON.					
Dawson, Lewis R.	Major and Surg.	1st Infantry	May 7, 1898.	.....	Still in service.
McVan Patten, William.	1st Lieut. and Asst. Surg.	1st Infantry	May 7, 1898.	.....	Still in service.
Brown, Elmer M.	1st Lieut. and Asst. Surg.	1st Infantry	May 7, 1898.	.....	Still in service.
Pocock, James N.	1st Lieut. and Asst. Surg.	Battalion Infantry	June 25, 1898.	.....	M. O. Oct. 28, '98.
WEST VIRGINIA.					
Baguley, Henry B.	Major and Surg.	1st Infantry	May 5, 1898.	.....	M. O. Feb. 4, '99.
Gilham, Cuthbert.	1st Lieut. and Asst. Surg.	1st Infantry	May 5, 1898.	.....	Resigned Aug. 27, '98.
Nesbitt, Charles T.	1st Lieut. and Asst. Surg.	1st Infantry	May 5, 1898.	.....	M. O. Feb. 4, '99.
Hogg, Cassius C.	1st Lieut. and Asst. Surg.	1st Infantry	May 23, 1898.	.....	M. O. Feb. 4, '99.
Henshaw, William T.	Major and Surg.	2d Infantry	June 24, 1898.	.....	M. O. April 10, '99.
Kalbaugh, Zadoc T.	1st Lieut. and Asst. Surg.	2d Infantry	June 24, 1898.	.....	M. O. April 10, '99.

LIST OF MEDICAL OFFICERS, Etc.—Concluded.

Name.	Rank.	State and Regiment.	Muster-In.	Muster-Out.
Dailey, William F.....	1st Lieut. and Asst. Surg.....	WEST VIRGINIA.—Cont. 2d Infantry	June 24, 1898.....	Resigned Jan. 18, '99.
Evans, Theodore W.....	Major and Surg.....	WISCONSIN. 1st Infantry	May 14, 1898.....	M. O. Oct. 19, '98.
Whiting, Joseph B., Jr.....	1st Lieut. and Asst. Surg.....	1st Infantry	May 14, 1898.....	Resigned Sept. 7, '98.
McDill, John R.....	1st Lieut. and Asst. Surg.....	1st Infantry	May 14, 1898.....	Appointed Major and Brigade Surgeon July 14, '98.
Heidershede, George N.....	1st Lieut. and Asst. Surg.....	1st Infantry	July 27, 1898.....	M. O. Oct. 19, '98.
Bradley, Harry E.....	Major and Surg.....	2d Infantry	May 12, 1898.....	M. O. Nov. 15, '98.
Moulding, Frank C.....	Captain and Asst. Surg.....	2d Infantry	May 12, 1898.....	M. O. Nov. 15, '98.
Mann, Horace E.....	1st Lieut. and Asst. Surg.....	2d Infantry	May 12, 1898.....	Resigned July 7, '98.
De Sombre, Karl.....	1st Lieut. and Asst. Surg.....	2d Infantry	July 23, 1898.....	M. O. Nov. 15, '98.
Edwards, John B.....	Major and Surg.....	3d Infantry	May 11, 1898.....	M. O. Jan. 14, '99.
Grannis, Edward H.....	1st Lieut. and Asst. Surg.....	3d Infantry	May 11, 1898.....	M. O. Jan. 14, '99.
Morse, A. Judson.....	1st Lieut. and Asst. Surg.....	3d Infantry	May 11, 1898.....	Resigned Oct. 18, '98.
King, Charles F.....	Major and Surg.....	4th Infantry	July 11, 1898.....	M. O. Feb. 28, '99.
Seaman, Gilbert E.....	Captain and Asst. Surg.....	4th Infantry	July 11, 1898.....	M. O. Feb. 28, '99.
Carey, Charles H.....	Captain and Asst. Surg.....	4th Infantry	July 11, 1898.....	M. O. Feb. 28, '99.
Morrison, John S.....	1st Lieut. and Asst. Surg.....	WYOMING. 1st Infantry	May 4, 1898.....	Still in service.

LIST OF MEDICAL OFFICERS, WAR WITH SPAIN.

ROSTER OF VOLUNTEER MEDICAL OFFICERS.

81

Name.	Rank.	Organization and Regiment.	Date of Acceptance of Commission.	Muster-Out.
U. S. V. CAVALRY.				
La Motte, Henry.....	Major and Surgeon.....	1st U. S. V. Cav.....	May 19, 1898.....	M. O. Sept. 15, '98.
Massie, James A.....	1st Lieut. and Asst. Surg.....	1st U. S. V. Cav.....	May 2, 1898.....	M. O. Sept. 15, '98.
Church, James R.....	1st Lieut. and Asst. Surg.....	1st U. S. V. Cav.....	May 12, 1898.....	M. O. Sept. 15, '98.
Jesurun, Mortimer.....	Major and Surgeon.....	2d U. S. V. Cav.....	May 27, 1898.....	M. O. Oct. 24, '98.
Root, Matt. R.....	1st Lieut. and Asst. Surg.....	2d U. S. V. Cav.....	June 21, 1898.....	M. O. Oct. 24, '98.
White, George R.....	1st Lieut. and Asst. Surg.....	2d U. S. V. Cav.....	July 29, 1898.....	M. O. Oct. 24, '98.
Fish, Henry G.....	Major and Surgeon.....	3d U. S. V. Cav.....	June 18, 1898.....	Resignation accepted Aug. 17, '98.
Wilson, Roy A.....	Captain and Asst. Surg.....	3d U. S. V. Cav.....	May 23, 1898.....	M. O. Sept. 8, '98.
Grigsby, Edward S.....	1st Lieut. and Asst. Surg.....	3d U. S. V. Cav.....	July 13, 1898.....	M. O. Sept. 8, '98.
Files, Fred H.....	Acting Asst. Surg.....	3d U. S. V. Cav.....		Employed from May 9 to May 20, '98.
U. S. V. ENGINEERS.				
Seaman, Louis L.....	Major and Surgeon.....	1st U. S. V. Eng.....	June 16, 1898.....	M. O. Jan. 25, '99.
Webb, Walter D.....	1st Lieut. and Asst. Surg.....	1st U. S. V. Eng.....	June 23, 1898.....	M. O. Jan. 25, '99.
Proben, Charles I.....	1st Lieut. and Asst. Surg.....	1st U. S. V. Eng.....	July 11, 1898.....	M. O. Jan. 25, '99.
Meacham, Franklin A.....	Major and Surgeon.....	2d U. S. V. Eng.....	June 29, 1898.....	Resigned April 15, '99.
McKenna, Patrick J.....	1st Lieut. and Asst. Surg.....	2d U. S. V. Eng.....	July 30, 1898.....	M. O. May 16, '99.
Barrett, E. J.....	Major and Surgeon.....	2d U. S. V. Eng.....	July 18, 1898.....	M. O. May 16, '99.
Lyon, George E.....	Major and Surgeon.....	3d U. S. V. Eng.....	June 28, 1898.....	Resigned Feb. 12, '99.
Schuelke, Julius A.....	Major and Surgeon.....	3d U. S. V. Eng.....	July 12, 1898.....	M. O. May 17, '99.
Gibbon, John A.....	1st Lieut. and Asst. Surg.....	3d U. S. V. Eng.....	July 1, 1898.....	Resigned Oct. 17, '98.
Hinkel, Henry J.....	1st Lieut. and Asst. Surg.....	3d U. S. V. Eng.....	October 31, 1898.....	M. O. May 17, '99.
Lemen, Harry R.....	1st Lieut. and Asst. Surg.....	3d U. S. V. Eng.....	April 25, 1899.....	M. O. May 17, '99.
TERRITORIAL INFY.				
Baker, Wm. P.....	Major and Surg.....	1st Ter. V. I.....	July 6, 1898.....	M. O. Feb. 15, '99.
Lindley, Wm. E.....	1st Lieut. and Asst. Surg.....	1st Ter. V. I.....	July 10, 1898.....	M. O. Feb. 15, '99.

LIST OF MEDICAL OFFICERS, WAR WITH SPAIN.—Continued.

Name.	Rank.	Organization and Regiment.	Date of Acceptance of Commission.	Muster-Out.
		TERRITORIAL INFANTRY.—Cont.		
Cruikshank, Charles G.	1st Lieut. and Asst. Surg.	1st Ter. V. I.	December 23, 1898.	M. O. Feb. 15, '99.
Smith, H. M.	1st Lieut. and Asst. Surg.	1st Ter. V. I.	July 2, 1898.	Resigned Nov. 7, '98.
Starley, Wm. F.	Major and Surgeon.	U. S. V. INFANTRY.	July 2, 1898.	M. O. Oct. 28, '98.
Ingalls, Henry A.	1st Lieut. and Asst. Surg.	1st U. S. V. Inf.	July 2, 1898.	M. O. Oct. 28, '98.
Boyd, James G.	1st Lieut. and Asst. Surg.	1st U. S. V. Inf.	July 6, 1898.	M. O. Oct. 28, '98.
Stewart, Floyd	Major and Surgeon.	2d U. S. V. Inf.	June 20, 1898.	M. O. June 22, '99.
Combel, Henry J.	1st Lieut. and Asst. Surg.	2d U. S. V. Inf.	July 23, 1898.	M. O. June 22, '99.
Bruning, Charles.	1st Lieut. and Asst. Surg.	2d U. S. V. Inf.	July 26, 1898.	Resigned Feb. 8, '99.
Gomez, Vincente.	1st Lieut. and Asst. Surg.	2d U. S. V. Inf.	April 2, 1899.	Discharged May 25, '99.
Norman, Seaton.	Major and Surgeon.	3d U. S. V. Inf.	June 23, 1898.	M. O. May 2, '99.
Chapman, Wm. A.	1st Lieut. and Asst. Surg.	3d U. S. V. Inf.	July 21, 1898.	M. O. May 2, '99.
Le Hardy, Julius C.	1st Lieut. and Asst. Surg.	3d U. S. V. Inf.	October 12, 1898.	M. O. May 2, '99.
Toole, James A.	1st Lieut. and Asst. Surg.	3d U. S. V. Inf.	July 5, 1898.	Resigned July 10, '98.
Henry, Joseph N.	Major and Surgeon.	4th U. S. V. Inf.	June 13, 1898.	M. O. June 8, '99.
Ford, Clyde S.	1st Lieut. and Asst. Surg.	4th U. S. V. Inf.	June 16, 1898.	Resigned Jan. 25, '99.
McGrath, Patrick J.	1st Lieut. and Asst. Surg.	4th U. S. V. Inf.	June 27, 1898.	Discharged May 11, '99.
Winchester, Sprague.	Major and Surgeon.	5th U. S. V. Inf.	June 10, 1898.	Discharged Aug. 26, '98.
Pollard, Chas. T.	Major and Surgeon.	5th U. S. V. Inf.	July 12, 1898.	M. O. May 31, '99.
Anderson, Lomax S.	1st Lieut. and Asst. Surg.	5th U. S. V. Inf.	July 12, 1898.	M. O. May 31, '99.
Howell, Evan P.	1st Lieut. and Asst. Surg.	5th U. S. V. Inf.	September 14, 1898.	Discharged April 1, '99.
Greenewalt, John C.	Major and Surgeon.	5th U. S. V. Inf.	April 22, 1899.	M. O. May 31, '99.
Robinson, Frank P.	1st Lieut. and Asst. Surg.	6th U. S. V. Inf.	June 30, 1898.	M. O. March 15, '99.
Massey, Zachary D.	1st Lieut. and Asst. Surg.	6th U. S. V. Inf.	June 20, 1898.	M. O. March 15, '99.
Cox, John W.	1st Lieut. and Asst. Surg.	6th U. S. V. Inf.	June 20, 1898.	M. O. March 15, '99.
Tanner, Wm. T.	A. A. Surg. (Contract).	6th U. S. V. Inf.	Contract, August 26, 1898.	Relieved Nov. 30, '98.
Davis, John G.	Major and Surgeon.	7th U. S. V. Inf.	June 30, 1898.	Resigned to accept appointment as Brigade Surgeon.
Burr, Rollin T.	1st Lieut. and Asst. Surg.	7th U. S. V. Inf.	June 29, 1898.	M. O. Feb. 28, '99.

U. S. V. INFANTRY—Cont.			
Shockley, M. A. W.....	Major and Surgeon.....	7th U. S. V. Inf.....	July 15, 1898.....
Wever, John S.....	1st Lieut. and Asst. Surg.....	7th U. S. V. Inf.....	October 3, 1898.....
Hepburn, James H.....	Major and Surgeon.....	8th U. S. V. Inf.....	June 17, 1898.....
Purnell, Wm. W.....	1st Lieut. and Asst. Surg.....	8th U. S. V. Inf.....	July 6, 1898.....
Bell, Joseph L.....	1st Lieut. and Asst. Surg.....	8th U. S. V. Inf.....	July 6, 1898.....
Pallones, Aurelio.....	Major and Surg.....	9th U. S. V. Inf.....	July 2, 1898.....
Mitchell, James.....	Major and Surgeon.....	9th U. S. V. Inf.....	July 3, 1898.....
Dunshie, John F.....	1st Lieut. and Asst. Surg.....	9th U. S. V. Inf.....	July 12, 1898.....
Black, Allen J.....	1st Lieut. and Asst. Surg.....	9th U. S. V. Inf.....	March 11, 1899.....
Apple, W. Edson.....	1st Lieut. and Asst. Surg.....	9th U. S. V. Inf.....	March 23, 1899.....
Fuqua, Wm. M.....	Major and Surgeon.....	10th U. S. V. Inf.....	July 4, 1898.....
Dysart, John C.....	1st Lieut. and Asst. Surg.....	10th U. S. V. Inf.....	June 28, 1898.....
Stoney, George N.....	1st Lieut. and Asst. Surg.....	10th U. S. V. Inf.....	July 5, 1898.....
			M. O. Feb. 28, '99.
			M. O. Feb. 28, '99.
			M. O. March 6, '99.
			M. O. March 6, '99.
			M. O. March 6, '99.
			Discharged Jan. 7, '99.
			M. O. May 25, '99.
			Resigned Dec. 19, '98.
			M. O. May 25, '99.
			M. O. May 25, '99.
			Dismissed Dec. 4, '98.
			M. O. March 8, '99.
			M. O. March 8, '99.

LIST OF MEDICAL OFFICERS, VOLUNTEER ARMY.

Name.	Rank.	Appointed from	Appointed.	Discharged.	Assigned.
Benjamin F. Pope.....	Chief Surg., Lt. Col.	Army.....	May 9, '98.....	Oct. 31, '98.....	5th A. C.
Robert M. O'Reilly.....	Chief Surg., Lt. Col.	Army.....	May 9, '98.....	May 12, '99.....	4th A. C., later, Div. of Cuba.
Alfred C. Girard.....	Chief Surg., Lt. Col.	Army.....	May 9, '98.....	April 12, '99.....	2d A. C.
John Van R. Hoff.....	Chief Surg., Lt. Col.	Army.....	May 9, '98.....	Nov. 5, '98.....	3d A. C., later, Dept. Porto Rico.
Louis M. Maus.....	Chief Surg., Lt. Col.	Army.....	May 9, '98.....	April 21, '99.....	7th A. C.
Nicholas Senn.....	Chief Surg., Lt. Col.	Ill.....	May 9, '98.....	Sept. 17, '98.....	Chief Operator in the Field.
Rush Huidekoper.....	Chief Surg., Lt. Col.	Penn.....	May 9, '98.....	Nov. 15, '98.....	1st A. C.
Valery Havard.....	Chief Surg., Lt. Col.	Army.....	Aug. 1, '98.....	Nov. 5, '98.....	5th A. C.
Henry S. Turrill.....	Chief Surg., Lt. Col.	Army.....	Nov. 7, '98.....	Feb. 28, '99.....	4th A. C.
Timothy E. Wilcox.....	Chief Surg., Lt. Col.	Army.....	Nov. 7, '98.....	May 12, '99.....	1st A. C.
Jefferson R. Kean.....	Chief Surg., Lt. Col.	Army.....	Feb. 21, '99.....	April 17, '99.....	7th A. C.
Philip F. Harvey.....	Chief Surg., Lt. Col.	Army.....	July 8, '99.....	July 31, '99.....	1st Div., 2d A. C.
George Cook.....	Chief Surg., Major..	N. H.....	May 20, '98.....	Sept. 30, '98.....	Staff Maj. Gen'l Miles.
William H. Daly.....	Chief Surg., Major..	Penn.....	May 20, '98.....	Jan. 18, '99.....	1st Div., 1st A. C.
Clayton Parkhill.....	Chief Surg., Major..	Colo.....	May 20, '98.....	Sept. 30, '98.....	1st Div., 1st A. C.
James M. Jenne.....	Chief Surg., Major..	Vt.....	May 20, '98.....	Dec. 3, '98.....	2d Div., 3d A. C.
Herbert W. Cardwell....	Chief Surg., Major..	Ore.....	May 20, '98.....	.....	1st Div., 8th A. C.
James H. Hysell.....	Chief Surg., Major..	Ohio.....	May 20, '98.....	.....	2d Div., 1st A. C., later, Dept. Santa Clara.
Leonard B. Almy.....	Chief Surg., Major..	Conn.....	May 20, '98.....	Oct. 5, '98.....	2d Div., 2d A. C., later, Cp. Wikoff.
Charles B. Nancrede.....	Chief Surg., Major..	Mich.....	May 20, '98.....	Sept. 28, '98.....	1st Div., 2d A. C., later, Cp. Wikoff.
Thomas E. Evins.....	Chief Surg., Major..	Ala.....	May 20, '98.....	Oct. 31, '98.....	2d Div., 7th A. C.
Jefferson D. Griffith....	Chief Surg., Major..	Mo.....	May 20, '98.....	Dec. 2, '98.....	3d Div., 1st A. C.
R. Emmitt Giffin.....	Chief Surg., Major..	Minn.....	May 20, '98.....	Dec. 31, '98.....	Sternberg Gen'l Hospital.
Eduard Boeckmann	Chief Surg., Major..	.....	May 20, '98.....	Sept. 15, '98.....	1st Div., 7th A. C.
Thomas C. Kimball.....	Chief Surg., Major..	Ind.....	May 20, '98.....	Sept. 2, '98.....	3d Brig., 2d Div., 3d A. C.

Henry F. Hoyt.....	Chief Surg., Major...	Minn.....	May 20, '98.....	1st Div., 3d A. C., & 2d Div., 8th A. C.
John M. G. Woodbury..	Chief Surg., Major...	N. Y.....	May 17, '98.....	Cps. Thomas, Ga., and Winkoff, N. Y.
Lewis Schooler.....	Chief Surg., Major...	Iowa.....	May 17, '98.....	2d Div., 3d A. C.
Frank S. Bourns.....	Chief Surg., Major...	Ga.....	May 20, '98.....	Manila, P. I.
William H. Devine.....	Chief Surg., Major...	Mass.....	June 8, '98.....	1st Brig., 1st Div., 2d A. C.
William H. Arthur.....	Chief Surg., Major...	Army.....	June 4, '98.....	Comdg. Hosp. Ship "Missouri,"
George E. Bushnell.....	Chief Surg., Major...	Army.....	June 4, '98.....	Surg. Gen'l's office, Washington.
George R. Fowler.....	Chief Surg., Major...	N. Y.....	June 4, '98.....	3d Div., 7th A. C.
Donald Maclean.....	Chief Surg., Major...	Mich.....	June 4, '98.....	U. S. Gen'l Hosp., Ft. Monroe, Va.
Nelson H. Henry.....	Chief Surg., Major...	N. Y.....	July 8, '98.....	2d Div., 4th A. C.
Victor C. Vaughan.....	Chief Surg., Major...	Mich.....	July 8, '98.....	
Charles M. Robertson..	Chief Surg., Major...	Iowa.....	July 8, '98.....	
Charles M. Gandy.....	Chief Surg., Major...	Army.....	Jan. 7, '99.....	2d Div., 1st A. C.
John L. Phillips.....	Chief Surg., Major...	Army.....	Jan. 30, '99.....	2d Div., 2d A. C.
Edgar A. Mearns.....	Chief Surg., Major...	Army.....	Jan. 7, '99.....	
Paul Clendenin.....	Chief Surg., Major...	Army.....	Jan. 30, '99.....	1st Div., 7th A. C., later Santiago.
William C. Gorgas.....	Brig. Surg., Major...	Army.....	June 4, '98.....	
Henry P. Birmingham..	Brig. Surg., Major...	Army.....	June 4, '98.....	3d Brig., 1st Div., 1st A. C., later Ponce.
Marlborough C. Wyeth..	Brig. Surg., Major...	Army.....	June 4, '98.....	Med. Sup. Depot, 2d A. C.
Richard C. Johnson.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Santiago, Cuba.
Edward C. Carter.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Leiter & Sternberg General Hospitals.
William O. Owen.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Manila, P. I.
Peter R. Egan.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Porto Rico.
William J. Wakeman....	Brig. Surg., Major...	Army.....	June 4, '98.....	1st Brig., 1st Div., 1st A. C.
Wm. J. Stephenson.....	Brig. Surg., Major...	Army.....	April 30, '99.....	Dept. Santiago, Cuba.
Adrian S. Polhemus....	Brig. Surg., Major...	Army.....	June 4, '98.....	Camp Thomas, Georgia.
John L. Phillips.....	Brig. Surg., Major...	Army.....	Nov. 30, '98.....	See Chief Surgeon.
William C. Borden.....	Brig. Surg., Major...	Army.....	April 30, '99.....	Key West Gen'l Hospital.
Edgar A. Mearns.....	Brig. Surg., Major...	Army.....	March 31, '99.....	See Chief Surgeon.
			Jan. 17, '99.....	

LIST OF MEDICAL OFFICERS, VOLUNTEER ARMY.—Continued.

Name.	Rank.	Appointed from.	Appointed.	Discharged.	Assigned.
Guy L. Edie.....	Brig. Surg., Major...	Army.....	June 4, '98.....		San Fran., Cal., & 8th A. C., Manila.
William D. Crosby.....	Brig. Surg., Major...	Army.....	June 4, '98.....		In chg. 1st Reserve Hosp., 8th A. C.
Charles M. Gandy.....	Brig. Surg., Major...	Army.....	June 4, '98.....		See Chief Surgeon.
James E. Pilcher.....	Brig. Surg., Major...	Army.....	June 4, '98.....	March 22, '99.....	Med. Sup. Off., 7th A. C., & Savannah.
Charles B. Ewing.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Nov. 30, '98.....	2d Brig., 2d Div., 3d A. C.
Walter D. McCaw.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Nov. 30, '98.....	Santiago, Cuba.
Jefferson R. Kean.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Jan. 30, '99.....	1st Div., 7th A. C., see Chief Surgeon.
Henry I. Raymond.....	Brig. Surg., Major...	Army.....	June 4, '98.....		2d Div., 3d A. C., & Manila.
Francis J. Ives.....	Brig. Surg., Major...	Army.....	June 4, '98.....		Dept. Matanzas, Cuba.
William F. Kendall.....	Brig. Surg., Major...	Army.....	June 4, '98.....		2d Brig., 2d Div., 1st A. C., & Manila.
Edward R. Morris.....	Brig. Surg., Major...	Army.....	June 4, '98.....		Honolulu, H. I., & 8th A. C.
Henry S. T. Harris.....	Brig. Surg., Major...	Army.....	June 4, '98.....		Cavy. Div., 5th A. C., Manila.
William B. Banister...	Brig. Surg., Major...	Army.....	June 4, '98.....	April 30, '99.....	3d Brig., 1st Div., 2d A. C.
Paul Clendenin.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Jan. 30, '99.....	2d Div., 7th A. C., See Chief Surgeon.
Charles E. Woodruff....	Brig. Surg., Major...	Army.....	June 4, '98.....	March 22, '99.....	8th A. C., at Manila, P. I.
Eugene L. Swift.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Feb. 10, '99.....	1st & 2d Brig., 1st Div., 3d A. C.
Paul Shillock.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Nov. 30, '98.....	Santiago, & Camp Wikoff.
Ogden Rafferty.....	Brig. Surg., Major...	Army.....	June 4, '98.....	Nov. 30, '98.....	2d Div., 2d A. C.
Charles F. Mason.....	Brig. Surg., Major...	Army.....	June 4, '98.....	March 22, '99.....	1st A. C., Dept. Porto Rico.
James D. Glennan.....	Brig. Surg., Major...	Army.....	June 4, '98.....	May 12, '99.....	1st Brig., 3d Div., 1st A. C., & Matanzas.

ROSTER OF VOLUNTEER MEDICAL OFFICERS.

87

Alfred E. Bradley.....	Brig. Surg., Major.....	Army.....	June 4, '98.....	.....	April 26, '99.....	Comdg. Hosp. Ship "Relief," 3d Brig., 2d Div., 2d A. C., & Santiago.
Philip G. Wales.....	Brig. Surg., Major.....	Army.....	June 4, '98.....	.....	Feb. 22, '99.....	2d Brig., 1st Div., 1st A. C.
Charles M. Drake.....	Brig. Surg., Major.....	Ga.....	June 4, '98.....	.....	Nov. 5, '98.....	2d Brig., 2d Div., 2d A. C.
Joseph K. Weaver.....	Brig. Surg., Major.....	Penn.....	June 4, '98.....	.....	Oct. 31, '98.....	Leiter General Hospital.
John W. Bayne.....	Brig. Surg., Major.....	D C.....	June 4, '98.....	.....	Sept. 16, '98.....	2d Brig., 2d Div., 3d A. C.
Milo B. Ward.....	Brig. Surg., Major.....	Mo.....	June 4, '98.....	.....	Sept. 16, '98.....	3d Div., 4th A. C.
Schuyler C. Graves.....	Brig. Surg., Major.....	Mich.....	June 4, '98.....	.....	Sept. 16, '98.....	3d Div., 7th A. C.
George T. Vaughan.....	Brig. Surg., Major.....	M. H. S.....	June 4, '98.....	.....	April 12, '99.....	New York City.
Nathan S. Jarvis.....	Brig. Surg., Major.....	N. Y.....	June 4, '98.....	.....	May 4, '99.....	1st Brig., 2d Div., & 1st Brig., 1st Div., 1st A. C.
John C. Martin.....	Brig. Surg., Major.....	Ohio.....	June 4, '98.....	.....	May 12, '99.....	2d Brig., 2d Div., 7th A. C.
Peter D. Macnaughton..	Brig. Surg., Major.....	Mich.....	June 4, '98.....	.....	Feb. 22, '99.....	Dept. Puerto Principe, Cuba.
Samuel T. Armstrong...	Brig. Surg., Major.....	Ohio.....	June 4, '98.....	.....	.....	3d Brig., 3d Div., 1st A. C., & Montauk Point.
John Patterson Dodge..	Brig. Surg., Major.....	Ohio.....	June 4, '98.....	.....	June 30, '99.....	1st Div., 7th A. C.
John R. McDill.....	Brig. Surg., Major.....	Wis.....	June 4, '98.....	.....	Sept. 30, '98.....	2d Brig., 2d Div., 8th A. C.
Samuel O. L. Potter..	Brig. Surg., Major.....	Cal.....	June 4, '98.....	.....	Oct. 31, '98.....	1st Brig., 1st Div., 1st A. C.
George A. Smith.....	Brig. Surg., Major.....	Iowa.....	June 4, '98.....	.....	Sept. 15, '98.....	3d Brig., 2d Div., 1st A. C.
Arthur Snowden.....	Brig. Surg., Major.....	Va.....	June 4, '98.....	.....	Nov. 30, '98.....	2d Div., 3d A. C.
R. Stansbury Sutton...	Brig. Surg., Major.....	Penn.....	June 4, '98.....	.....	Oct. 20, '98.....	2d Brig., 1st Div., 2d A. C.
Frank Bruso.....	Brig. Surg., Major.....	N. Y.....	June 4, '98.....	.....	Sept. 2, '98.....	1st Div., 3d A. C.
George W. Crile.....	Brig. Surg., Major.....	Ohio.....	June 16, '98.....	.....	May 12, '99.....	2d Brig., 2d Div., 7th A. C.
Edward Martin.....	Brig. Surg., Major.....	Penn.....	June 16, '98.....	.....	Nov. 30, '98.....	1st Reserve Hosp., 8th A. C.
Calvin H. English.....	Brig. Surg., Major.....	Ind.....	June 16, '98.....	.....	.....	U. S. Gen'l Hosp., Ft. Mc- Pherson, Ga.
George B. Bunn.....	Brig. Surg., Major.....	Ohio.....	June 16, '98.....	.....	May 12, '99.....	3d Brig., 1st Div., 1st A. C.
George H. Penrose.....	Brig. Surg., Major.....	Utah.....	June 16, '98.....	.....	Feb. 22, '99.....	& Dept. Santa Clara.
Royce Day Fry.....	Brig. Surg., Major.....	Ohio.....	July 8, '98.....	.....	Oct. 13, '98.....	3d Brig., 2d Div., 2d A. C.
Elmer E. Heg.....	Brig. Surg., Major.....	Wash.....	July 8, '98.....	.....	.....	3d Brig., 2d Div., 2d A. C.
Charles R. Parke.....	Brig. Surg., Major.....	Penn.....	July 8, '98.....	.....	.....	.....
Jabez N. Jackson.....	Brig. Surg., Major.....	Mo.....	July 8, '98.....	.....	.....	.....

LIST OF MEDICAL OFFICERS, VOLUNTEER ARMY.—Continued.

Name.	Rank.	Appointed from.	Appointed.	Discharged.	Assigned.
Wallace Neff.....	Brig. Surg., Major...	Ohio.....	July 8, '98.....	Jan. 5, '99.....	Fort McPherson, Georgia.
George F. Shields.....	Brig. Surg., Major...	Cal.....	July 8, '98.....	May 12, '99.....	1st Brig., 2d Div., 8th A. C.
William S. Bryant.....	Brig. Surg., Major...	Mass.....	July 8, '98.....		2d Brig., 2d Div., 7th A. C.
Wladimir F. de Niedman	Brig. Surg., Major...	Kans.....	July 8, '98.....		1st Brig., 2d Div., 2d A. C., & Pinar del Rio.
Francis C. Ford.....	Brig. Surg., Major...	Tex.....	July 8, '98.....	May 12, '99.....	1st Brig., 1st Div., 7th A. C.
Lawrence C. Carr.....	Brig. Surg., Major...	Ohio.....	July 8, '98.....		U. S. Gen'l Hosp., Santiago, Cuba.
William L. Kneidler....	Brig. Surg., Major...	Army.....	July 30, '98.....	June 30, '99.....	Dept. Pinar del Rio, Cuba
Thomas O. Sumner.....	Brig. Surg., Major...	Tenn.....	Aug. 5, '98.....	Oct. 5, '99.....	
John J. Archinard.....	Brig. Surg., Major...	La.....	Aug. 11, '98.....	Mch. 22, '99.....	Santiago & Montauk Point, N. Y.
Ira G. Brown.....	Brig. Surg., Major...		Aug. 11, '98.....		2d Div., 7th A. C., & Mon- tauk Point.
Oscar Le Seure.....	Brig. Surg., Major...	Mich.....	Aug. 11, '98.....	Dec. 20, '98.....	Sternberg U. S. Gen'l Hosp.
Charles Adams.....	Brig. Surg., Major...	Ill.....	Aug. 11, '98.....	Sept. 15, '98.....	Camp Wikoff, N. Y.
Edward O. Shakespear.	Brig. Surg., Major...	Penn.....	Aug. 11, '98.....	June 30, '99.....	
Henry H. Lee.....	Brig. Surg., Major...	Vt.....	Aug. 11, '98.....	Mar. 22, '99.....	1st Cav. Div., 4th A. C.
Bial T. Bradbury.....	Brig. Surg., Major...	Me.....	Aug. 11, '98.....	Jan. 1, '99.....	2d Div. Hosp., 7th A. C.
John L. Macumber.....	Brig. Surg., Major...	N. Y.....	Aug. 11, '98.....	May 12, '99.....	1st Brig., 1st Div., 4th A. C., & Cienfuegos.
Simon P. Kramer.....	Brig. Surg., Major...	Ohio.....	Aug. 11, '98.....		U. S. Mil. Hosp. No. 2, Ha- vana.
John G. Davis.....	Brig. Surg., Major...	Ill.....	Aug. 11, '98.....		Sanitary Inspector, Havana.
John E. Woodbridge....	Brig. Surg., Major...	Ohio.....	Aug. 11, '98.....	Feb. 22, '99.....	1st Brig., 1st Div., 1st A. C. & Camp Wikoff.
Samuel W. Kelly.....	Brig. Surg., Major...	Ohio.....	Aug. 17, '98.....	Oct. 20, '98.....	Anniston, Alabama.
David G. Peyton.....	Brig. Surg., Major...	Ind.....	Aug. 17, '98.....	Feb. 22, '99.....	Philadelphia, Penna.
Wilfred Turnbull.....	Brig. Surg., Major...		Sept. 15, '98.....		Dept. Santiago.
George G. Groff.....	Brig. Surg., Major...	Penn.....	Sept. 17, '98.....	April 30, '99.....	Dept. Porto Rico.

Robert Burns	Brig. Surg., Major...	N. H.....	Oct. 6, '98.....	May 12, '99.....	3d Brig., 2d Div., 1st A. C., & Puerto Principe.
Ezequiel de la Calle...	Brig. Surg., Major...	N. Y.....	Oct. 8, '98.....	June 30, '99.....	Sanitary Inspector, Havana.
Lewis Balch.....	Brig. Surg., Major...	N. Y.....	Oct. 10, '98.....		Sanitary Insp., Santa Clara.
William B. Winn.....	Brig. Surg., Major...	Mo.....	Oct. 20, '98.....		Matanzas, Cuba.
William Dolz.....	Brig. Surg., Major...	N. Y.....	Oct. 20, '98.....	April 5, '99.....	Santiago, Cuba.
William J. Kernachan...	Brig. Surg., Major...	Ala.....	Oct. 20, '98.....	April 30, '99.....	Camp Shipp, Ala.
Willard S. H. Matthews.	Brig. Surg., Major...	Iowa.....	Oct. 24, '98.....		San Francisco, Cal., & Ma- nila.
Rafael F. Echeverria...	Brig. Surg., Major...		Nov. 15, '98.....		Mil. Hosp. No. 1, Havana.
Willis G. MacDonald...	Brig. Surg., Major...	N. Y.....	June 4, '98.....	Aug. 4, '98.....	Field Hosp., 2d Div., 3d A. C.
Charles E. Ruth.....	Brig. Surg., Major...	Iowa.....	June 4, '98.....	July 29, '98.....	
Charles T. Newkirk.....	Brig. Surg., Major...	Mich.....	Sept. 8, '98.....	Oct. 31, '98.....	
Martin L. Focht.....	Brig. Surg., Major...	Penn.....	Oct. 3, '98.....	Nov. 5, '98.....	
Francis T. Metcalfe...	Brig. Surg., Major...		Sept. 30, '98.....	Nov. 11, '98.....	Hosp. Ship "Relief,"
Henry D. Thomason...	Brig. Surg., Major...	Mich.....	Nov. 28, '98.....		10th U. S. Cav., Cuba.
Randall R. Hunter.....	Brig. Surg., Major...	Kans.....	Dec. 1, '98.....	June 30, '99.....	U. S. Gen'l Hosp., Santiago.
Damaso T. Laine.....	Brig. Surg., Major...	Cuba.....	Dec. 14, '98.....		Att'dg. Surg. Hqrs. Div. Cuba.
Orlando Ducker.....	Brig. Surg., Major...		Jan. 21, '99.....		Yellow Fever Hosp., Havana.
James M. Cabell.....	Brig. Surg., Major...		Jan. 30, '99.....		Manila, P. I.
Frederick J. Combe...	Brig. Surg., Major...	Tex.....	Jan. 30, '99.....		Dept. Santiago, Cuba.
Azel Ames.....	Brig. Surg., Major...	Mass.....	Feb. 20, '99.....	June 30, '99.....	Porto Rico.
Franklin A. Meacham...	Brig. Surg., Major...		April 5, '99.....		Mil. Hosp. No. 1, Havana, Cuba.

VOLUNTEER MEDICAL OFFICERS, U. S. NAVY, DURING SPANISH-AMERICAN WAR.

Name.	Appointed from.	Appointed.	Discharged.	Duty.
PASSED ASSISTANT SURGEONS.				
Relative rank of Lieutenant.				
Gardner W. Allen.....	Mass.....	April 23, '98.....	Sept. 23, '98.....	"Prairie."
Sidney O. Heiskell.....	Md.....	April 30, '98.....	Dec. 9, '98.....	"Dixie."
John P. McGowan.....	N. Y.....	April 30, '98.....	Sept. 8, '98.....	"Yankee."
Delos L. Parker.....	Mich.....	May 9, '98.....	Aug. 26, '98.....	"Yosemite."
Norval H. Pierce.....	Ills.....	May 14, '98.....	Sept. 30, '98.....	Recruiting.
Peter McGill.....	N. J.....	May 20, '98.....	Dec. 1, '98.....	"Resolute."
Maxwell S. Simpson.....	N. Y.....	May 21, '98.....	Oct. 22, '98.....	"Badger."
John C. MacEvitt.....	N. Y.....	May 24, '98.....	Sept. 9, '98.....	"Jason."
Robert L. Parker.....	N. Y.....	May 18, '98.....	Sept. 2, '98.....	"St. Louis."
Relative rank of Lieutenant. (Junior Grade.)				
Henry H. Forbes.....	N. Y.....	May 12, '98.....	July 5, '98.....	"Nahant."
Richard F. O'Neil.....	Mass.....	May 21, '98.....	Sept. 24, '98.....	"Catskill."
Charles F. Peckham.....	R. I.....	June 29, '98.....	Sept. 20, '98.....	Auxiliary Force.
James S. King.....	N. Y.....	June 8, '98.....	Sept. 14, '98.....	"New Hampshire."
ASSISTANT SURGEONS.				
Relative Rank of Ensign.				
Frank B. Hancock.....	Penn.....	April 25, '98.....		"Puritan."
George M. Coates.....	Penn.....	April 25, '98.....	Oct. 13, '98.....	"New Orleans."

John J. Snyder.....	Penn.....	April 25, '98.....	Sept. 15, '98.....	"Miantonomah."
Henry A. Dunn.....	D. C.....	April 25, '98.....	Sept. 8, '98.....	"Newark."
Allan Stuart.....	S. C.....	April 25, '98.....	Sept. 8, '98.....	Naval Stn., Pt. Royal.
Edward M. Blackwell.....	Va.....	April 25, '98.....	Sept. 8, '98.....	"Vulcan."
Anton Heger.....	N. Y.....	April 25, '98.....	Sept. 15, '98.....	"St. Paul."
Jerome S. Chaffee.....	N. J.....	May 2, '98.....	Sept. 8, '98.....	Recvg. Ship "Vermont."
Harold A. Johnson.....	Mass.....	May 2, '98.....	Sept. 8, '98.....	"Terrot."
John F. Bransford.....	Va.....	May 4, '98.....	Sept. 8, '98.....	"Gloucester."
Henry D. Averill.....	Me.....	May 9, '98.....	April 5, '99.....	"Lancaster."
Frank S. Fielder.....	N. Y.....	May 9, '98.....	Sept. 27, '98.....	"Cincinnati."
Richard E. Edes.....	Mass.....	May 12, '98.....	Oct. 18, '98.....	"Celtic."
Charles N. Barney.....	Mass.....	May 12, '98.....	Sept. 15, '98.....	"Scindia."
William H. Ulsch.....	Penn.....	May 12, '98.....	Oct. 3, '98.....	"Yankton."
Smith H. McKim.....	Md.....	May 12, '98.....	Oct. 3, '98.....	Navy Yard, Norfolk.
Lauris B. Baldwin.....	Ills.....	May 14, '98.....	Aug. 23, '98.....	"Alexander."
T. Ogier Hutson.....	S. C.....	May 20, '98.....	Sept. 8, '98.....	Naval Sta., Pt. Royal.
John R. M. Dillon.....	La.....	May 20, '98.....	Sept. 19, '98.....	"Passaic."
James M. Ward.....	N. C.....	May 20, '98.....	Sept. 20, '98.....	"Nantucket."
Albert H. Heppner.....	N. Y.....	May 20, '98.....	Nov. 7, '98.....	"Amphitrite."
Silas V. Merritt.....	Mass.....	May 21, '98.....	Sept. 13, '98.....	"Lehigh."
Mack V. Stone.....	Cal.....	May 24, '98.....	Sept. 13, '98.....	"Nero."
Chauncey R. Burr.....	Cal.....	May 24, '98.....	Sept. 22, '98.....	"Monterey."
Owen T. Smith.....	Me.....	May 25, '98.....	Sept. 22, '98.....	"Montauk."
Robert G. La Conte.....	Penn.....	May 25, '98.....	Sept. 12, '98.....	"Lancaster."
Frank E. Wagner.....	Md.....	May 25, '98.....	Oct. 20, '98.....	Auxiliary Force.
Dennis F. Sughrue.....	Mass.....	June 2, '98.....	Feb. 14, '99.....	"Abarenda."
Henry E. Odell.....	Ohio.....	June 2, '98.....	Sept. 2, '98.....	"Philadelphia."
Barton L. Wright.....	Penn.....	June 13, '98.....	Sept. 2, '98.....	"Supply."
George F. Freeman.....	Mass.....	June 13, '98.....	Sept. 2, '98.....	"Peoria."
Francis M. Furlong.....	N. Y.....	June 13, '98.....	Sept. 2, '98.....	"Siren."
Albert F. Graf.....	Penn.....	June 17, '98.....	Sept. 2, '98.....	"Yale."
Holton C. Curl.....	Cal.....	June 18, '98.....	Sept. 2, '98.....	Naval Hosp., Mare Island.
William L. Bell.....	Cal.....	June 18, '98.....	Dec. 1, '98.....	Navy Yard, Mare Island.
Thomas G. Odell.....	Utah.....	June 29, '98.....	Dec. 1, '98.....	"Cesar."
James S. Taylor.....	N. J.....	June 29, '98.....	Dec. 1, '98.....	"Leonidas."
Raphael O. Marcour.....	La.....	June 29, '98.....	Dec. 1, '98.....	"Pompey."

VOLUNTEER MEDICAL OFFICERS, U. S. NAVY, DURING SPANISH-AMERICAN WAR.—Concluded.

Name.	Appointed from.	Appointed.	Discharged.	Duty.
ASSISTANT SURGEONS.—Continued.				
James H. Payne, Jr.....	Mass.....	June 29, '98.....		Mar. Rendvs., Boston.
John B. Gibbs.....	Va.....	April 25, '98.....	Killed June 12, '98.....	Marine Battalion.
William E. Tukey.....	Me.....	July 27, '98.....	Sept. 26, '98.....	"Nahant."
Philip S. Rieg.....	Ohio.....	July 30, '98.....	Sept. 27, '98.....	"Alexander."
Jacob Stepp.....	Mass.....	July 8, '98.....		"Independence."
Charles H. DeLancy.....	N. Y.....	July 8, '98.....		"Amphitrite."
Fred M. Bogan.....	D. C.....	July 13, '98.....		"Wabash."
R. K. McClanahan.....	Va.....	July 13, '98.....		Hosp., Philadelphia.
W. E. G. High.....	Penn.....	July 13, '98.....		"Celtic."

II. BASSINI'S OPERATION FOR RADICAL CURE OF HERNIA—SEVEN SUCCESSFUL CASES.¹

BY CAPTAIN GEORGE WORTH WOODS,
MEDICAL DIRECTOR, U. S. NAVY.

EVER since my association with the United States Navy, and especially my connection with its hospital practice, I have been impressed with the necessity of an operation which should be a radical cure for hernia, it being the opprobrium of both the Army and Navy medical service, that so many enlisted men of both the Army and Navy are discharged with this disability without any attempt at cure, due to the fact that the men decline operation—which they are permitted to do—because their attending surgeon could not promise them a cure, believing firmly himself that no operation could be performed which would ensure perfect ability to do duty, and this has been the history of most cases in my operative experience of an earlier date in which the operations of Wood and Wutzer were the rule, which I early instituted in hospitals under my charge.

But with the introduction of the operation of Bassini, a different result has been attained and it would now seem that we have a reliable operation as free from danger as any that could be instituted, in the majority of cases really a radical cure, and presenting every probability of the enlisted man being returned to duty, in a sound condition, capable of performing any hard work involving strain without danger of a recurrence of the hernia.

The reasons for performing this operation may be thus enumerated, and the advantages attained are:

1. For the physical betterment of the individual.
2. The saving of a life pension to the government.
3. The retention in the service of valuable men, and men desirous of continuing in the Navy or Marine Corps.
4. Under proper technique, the small percentage of recurrences (less than 1 per cent.) and trifling danger as regards life, in

¹ From Records of United States Naval Hospital, Brooklyn, N. Y.

these otherwise fine physical specimens, almost demand the operation as a duty.

5. The repeated drills in aseptic technique and its repeated accomplishment, inspire confidence in hesitating surgeons and will broaden their field of operative work generally.

6. The possibility of strangulation is made very remote.

OPERATIVE TECHNIQUE AND HISTORY OF CASES.

Usual preparation of dressings, patient, hands, instruments, etc., for aseptic work.

The wounds were kept as free from blood as possible by clamping vessels before they were cut. Some modification of Bassini's method was practiced. One or more sutures were introduced above the cord in the deep line. The cord and sac were separated, the latter opened, tied off high up, cut off and the stump put back into the abdomen. When no sac could be demonstrated, the component parts of the cord were identified and no tissue resembling a sac was seen. The conjoined tendon and Poupart's ligament were brought together with interrupted sutures of heavy chromicized catgut, one or two sutures being placed above the cord as noted above.

The divided aponeurosis of the external oblique muscle was united over the cord with a continuous line of chromicized catgut sutures, and the skin edges adjusted with plain catgut. No irrigation was employed. The wounds were wiped out with warm normal salt solution. Catharsis was induced on the third day. The patients were kept in bed for three weeks.

During first quarter of 1898 three cases were submitted to operation with perfect results save in one case in which atrophy of testicle occurred, due to acute epididymitis, and in a second, a congenital one, there was great difficulty in separating sac from cord, due to inflammatory adhesions.

A fourth case of incomplete indirect inguinal hernia easily reducible, was operated on in third quarter of same year, and was completely successful primary union of incision occurring on fifth day.

The remaining cases were operated upon soon after the occurrence of the rupture in most instances, and were well fitted for the radical cure on that account.

In some the hernias were little more than bubonocèles, and the intestine had not been extruded more than two or three times before operation. In some of these cases no sac could be demonstrated after careful search.

Case 1. Brown, R. P., landsman, æt. 28 years. Right oblique inguinal hernia which had been down but twice before operation. Said to have occurred as a result of lifting, three months before operation. General physique excellent. Operation April 19, 1899. Anesthetic, ether, from which the patient reacted well. No sac could be found after a painstaking search. Post-operative condition normal. Wound united by first intention. Patient under observation until June 3, 1899, when he was sent to duty, cured.

Case 2. Austin, Albert, ordinary seaman, æt. 49 years. Left, incomplete, reducible inguinal hernia. Said to have followed a strain induced by slipping on deck while carrying a heavy weight, about seven weeks before operation. General condition good. Operation May 19, 1899. Anesthetic, ether, from which he reacted well. Sac present and removed. Post-operative condition normal. Wound united by first intention. Patient under observation until August 5, 1899, when he was sent to duty, cured.

Cases 3 and 4. Load, J. B., master at arms, first class, æt. 35 years. Double bubonocèle. The hernias were said to have been first noticed after injuries received in the "Maine" explosion, fourteen months prior to operation. General condition excellent. *Double operation*, May 19, 1899. Anesthetic, ether, from which the patient reacted well. The aponeurosis of the external oblique muscle on each side was extremely thin, and the transversalis fascia on each side was bulging forward. No sac could be demonstrated on either side. Post-operative condition normal. Wounds united by first intention. Patient was sent to duty, cured, on July 11, 1899.

Case 5. Gilhuley, C. H., chief machinist, æt. 35 years. Left oblique inguinal hernia; reducible. Said to have been first noticed after two days of "trying work on the feed pumps." General condition fair. Operation, June 15, 1899. Anesthetic, ether, from which the patient reacted well. A dense sac was removed. Post-operative condition normal. Wound united by first intention. Patient still in hospital under observation. Result perfect. To be sent to duty shortly.

Cases 6 and 7. Sundell, J., coxswain, æt. 28 years. Reducible oblique inguinal hernia; both sides. Right said to have resulted from exertion on a boat davit, eighteen months before operation, and the left appeared one month before. Both have

been continuously retained with trusses. General condition excellent. Double operation, July 27, 1899. Anesthetic, ether, from which patient reacted well. No sac demonstrated on either side. Post-operative condition normal. Wounds united by first intention. Still under observation. Result perfect.

The herniotomies that were recorded in 1898 were performed admirably by Assistant Surgeon James R. Whiting, U. S. N., a satisfactory conclusion resulting in each case; all the men having been returned to duty. No relapse has as yet been reported in any case.

The herniotomies of this year were all performed by Past Assistant Surgeon Charles F. Stokes, U. S. N.—my executive surgeon,—and I cannot too earnestly commend his care and skill, nor do honor to his admirable technique and successful result in every case.

III. MANAGEMENT OF A FIELD HOSPITAL.

By WILLIAM H. DEVINE, M. D.,

LIEUT. COL. AND MEDICAL DIRECTOR, 2D. BRIGADE, M. V. M.;
LATE MAJOR AND BRIGADE SURGEON, U. S. V.

NO matter how well planned the management of a field hospital in time of peace, it is apt to fall below the ideal in time of war. The most important element in its success is proper equipment at the start; that is, a proper fitting out with everything needed for the successful administration. After the hospital has been set up, and the machinery set in motion by experienced hands, with a good surgeon in charge and easy access to medical and other supplies, the difficulties encountered in its superintendence should not be great. In order to consider the subject intelligently, it is necessary to consider a hospital for the accommodation of a certain number of cases. For a Division containing about 12,000 men, a hospital to accommodate 400 sick should be set up and equipped in the most thorough manner. Supplies, including tents, furniture, bedding, etc., should be on hand to enlarge as exigencies may demand.

The importance of having on hand supplies to enlarge the capacity for any emergency, cannot be overestimated. Smart says: "The experience of the past shows that if the division hospital is thoroughly prepared to give the needful primary attention to twelve hundred wounded, the history of its service will not fail to give satisfaction. All ordinary and probable occasions will be provided for, and if the extraordinary and unlikely should occur, the circumstances which attend them may be susceptible of being turned to account in the interest of the wounded." Taking a hospital of 400 beds as a basis for supplies, the number of medical attendants, nurses, etc., the number can be increased or decreased in proportion to the demands. It is hardly within the scope of this paper to enumerate the supplies needed for a hospital. I shall treat principally of important points in management, which have been suggested by experience in the late war, such as the duties of medical officers and nurses; the care of contagious dis-

eases, especially typhoid ; care of sinks, and the policing of hospital grounds. The medical staff of the hospital should comprise one surgeon in charge ; one surgeon to act as executive officer and one for quartermaster. Besides these, there should be one physician to each thirty (30) patients. If the medical attendant is industrious and capable, he can attend to this number. Thirty persons congregated in hospital are easier to care for than ten patients in ordinary civil practice scattered over a large area. A medical officer who properly cares for thirty sick men; gives desired thought and study to his cases and keeps good records, will have enough to occupy at least ten hours in the twenty-four.

The surgeon in charge has nothing to say in the selection of his medical officers, commissioned or contract surgeons, but he should see that proper discipline is maintained at the institution. He should give them instruction in their duties ; the time spent in the wards ; advice as to the treatment of disease ; the management of nurses, care of wards, policing, etc. The surgeon in charge is so busy with office work that he cannot devote all his time to the patients, and he must depend on the zealous and intelligent co-operation of his medical assistants. The medical officer must not be allowed to carry out his own methods in the treatment of important cases.

At Camp Alger a routine treatment was adopted for the care of typhoids to prevent inexperienced physicians from using some method which might be detrimental to the patients. Realizing the importance of a conservative method for treatment, I requested the attending surgeons, including the contract surgeons, to read Osler's treatment of typhoid fever ; after all had read the treatment, which I consider excellent, I called a meeting of the medical officers and directed them to submit to me a plan on which they could all agree. I then endorsed with some suggestions and forwarded to the Division Surgeon, who endorsed also with suggestions. This treatment was adopted as a regulation of the hospital and was not departed from except by the advice of the surgeon in charge or Consulting Board. It is easy to see the result if every man were allowed to practice his fads in a field hospital.

Nurses were selected mainly from hospital corps, but at times it was necessary to procure by detail from regiments.

There should be one nurse to every eight patients, for eight hours; three for twenty-four hours. A nurse to have a clear head should not work more than eight hours a day.

At First Division Hospital most of the nurses were inexperienced. There was not much time to instruct these men, as their services were urgently needed. Each acting assistant surgeon on duty gave one lecture to nurses; this gave eight or nine courses. The instruction comprised administration and doses of medicines, antiseptics, the care of typhoid, etc. I told the surgeons to dwell particularly on the care of typhoid fever, as it seemed to me that was the main and important work. I also gave several short talks to nurses on pulse, temperature, precautions surrounding administration of medicines, and kindred subjects.

Although hundreds of nurses were engaged in nursing typhoid fever patients at First Division Hospital, Camp Alger, during the five months of its existence, but few contracted the disease. I am sure that the percentage of contagious disease in the hospital corps, and hospital nurses, was far less than in most organizations in camp, and I can only account for this, by the fact that instruction in methods to prevent its communication made the nurses more careful than the ordinary soldier. Thorough instruction in all that pertains to rudimentary camp sanitation is as important to the soldier as training in "First Aid to Sick or Injured."

The average nurse has vague ideas on antiseptics, and its cardinal points should be firmly impressed. There is no excuse for not carrying out antiseptics properly. I quote the following from my "Notes of the Surgical History of a Field Hospital at Camp Alger," to show the method used in major operations. The same precautions were observed in all surgical cases. The case from which I quote was rupture of the spleen, with hemorrhage into abdominal cavity. Operator, Major Geo. W. Crile:

"Preliminary Preparations.—Orders were at once given to have water boiling in wash-boilers and to sprinkle the ground in and about the hospital so thoroughly as to prevent dust. Several basins and trays were sterilized by immersion (ten minutes) in the boiling water. The water used for the operation and intracellular infusion was passed through a Berkefeld filter and collected in sterilized buckets and basins; the instruments and dress-

ings were placed in the sterilizer. A dozen towels were boiled during the process of sterilization. The operator and assistants prepared their hands, while the stewards arranged the operating-table and the table for instruments. An apparatus for infusion for sterile normal saline solution was arranged by utilizing a fountain syringe. To the end of the rubber tube a needle from the Allen's bag was attached. The whole apparatus was easily sterilized by boiling. In the meantime, the patient, well wrapped in blankets, was placed upon the operating-table, and taking advantage of the slope upon which the hospital was pitched, a favorable incline of the patient was secured. During the reduction to surgical anesthesia the field of operation was surgically prepared. By the time reduction was completed, everything was in readiness for the operation. The table was placed near the entrance to the hospital, so that if necessary it might be placed in the open air to secure the necessary light, as the sun was going down. The zone of operation was well covered with sterile towels."

I can see no reason why same could not be done in a field hospital in active service. Sterilizing tablets, instruments, etc., occupy so little room that necessary stores can be carried to the field with little inconvenience. The nurses and medical officers were instructed by me as to the importance of using strict anti-septic methods even in minor cases. To show that there are some medical men even nowadays who do not realize the importance of antisepsis in treatment of wounds, I will say that I have seen a medical officer pass a probe into a wound without any preparation of instrument or wound. Such rough and careless surgery is not often seen in these modern times, but it shows the need of vigilance on the part of the surgeon in charge.

I believe contagious cases should be isolated in a remote portion of field if possible, even in camps of instruction. Every care should be taken, as in civil practice, to prevent spread of measles, scarlet fever, mumps and typhoid and other contagious and infectious diseases. In the late war, typhoid was the disease we had most to dread, and I shall devote some space to describing methods used in caring for the disease at Camp Alger.

The supervision of typhoid cases should be placed in the hands of reliable men. At Camp Alger First Division Hospital I appointed an acting assistant surgeon, a man of experience in

civil practice. Some quotations from Dr. Chas. V. Butler, the officer appointed, will give an idea of how typhoids were cared for:

"On the fourth of August, 1898, I reported for duty to Major Wm. H. Devine, Surgeon in Charge of the First Division Hospital at Camp Alger, Va., and until the tenth was in charge of the general ward; on that day I was ordered by Major Devine to separate all typhoid cases from the different wards and to isolate them in the first, second, third and fourth wards, which duty I fulfilled to the best of my knowledge. In conjunction with Captain Harry Mead of the 65th. New York, I took charge of the first and fourth wards.

"The order, *posted conspicuously* in the Headquarters tent, called the attention of the attending surgeons to the pages in 'Osler's Practice' referring to the disinfection and prophylaxis of typhoid fever, and we all had *repeated* verbal orders to the same effect. We also gave instructions to the nurses (regimental), concerning the care of patients, especially explaining to them the methods of disinfection of all cases in the hospitals, laying special stress on the importance of disinfection in typhoid fever. Our greatest trouble was to get the nurses to follow our orders, but in general the regimental nurses tried to do their duty so far as their knowledge went and only in a few cases were they incompetent to act as nurses.

"Major Devine again and again called our attention to the importance of disinfecting all stools and bed linen, and in my two wards the linen and nightshirts of the patient were changed as often as necessary, for we had an abundance of those articles. The bed-pans and urinals were washed out with Tri-kresol solution 1-100, and lime was kept in them when not in use. When lime was not to be had, we used 1-1000 bichloride of mercury solution and permanganate of potash. There was a special typhoid sink dug and every stool was covered with dirt as soon as bed-pans were emptied, and lime thrown in also (a barrel of lime was standing by sink all the time). The Officers of the Day inspected the sinks at least three times a day. The soiled linen was placed in tubs, pails, etc., filled with Tri-kresol solution, and when that was not to be had, we used 1-1000 bichloride solution. When we did not have pails or tubs enough, the linen was sprinkled with

disinfectants and placed in the sun. *After* disinfection, it was sent to the laundry to be washed.

"The tent floors (hospital) were flooded every morning with Tri-kresol solution 1-100, and scrubbed. I can remember but three patients of the hospital corps and one nurse who had typhoid fever, and they were living on the hospital grounds all the time. None of the surgeons and none of the sisters had or developed typhoid fever. Thinking it advisable to have a general plan of preparatory treatment of all fever cases, typhoid and malarial, Major Devine ordered a consultation of all the attending surgeons so as to formulate routine treatment for all suspects.

"I can remember none of those who did not improve under this treatment and who developed true typhoid;—just here I would like to say that if the war has not shown anything else in a medical sense, it has proven conclusively that there is a disease both clinically and microscopically that should be called typho-malarial fever, and if you find it nowhere else, you will find it in Virginia and Florida.

"My own treatment of the typhoid cases after the diagnosis was confirmed by consultation, was tonic doses of quinine combined with small doses of salol or bismuth subgallate. Cold sponging when temperature was over 102.5°. *Tr. nux vom.* and brandy were used as stimulants, with digitalis in severe cases. I depended more on *tr. nux vom.* than on brandy, but the latter was used quite freely, for the cases needed it and were given it from the day of admission, and I am sure it benefited them. All the patients I lost, died from cerebral complications and none from hemorrhage or peritonitis, and I saw only one case of typical tympanites; he died afterwards in Buffalo where he was taken against my advice. My treatment of hemorrhage was heroic doses of opium and ice packs. Ergotin was also used."

Policing of hospital grounds should be done by hospital corps. Later in the summer so many patients needed the care of hospital corps nurses that it was necessary to depend on a detail of men from regiments. Policing is so essential to the general welfare of hospital and camp that the surgeon in charge of division hospital should give it his personal attention. To illustrate the importance of this I will relate an incident in connection with the Second Division Hospital at Camp Meade. When I commenced

my duties as Chief Surgeon of Second Division I found the hospital grounds poorly policed. I called the attention of the surgeon in charge to the matter and he told me that a detail from _____ regiment was on duty for that purpose. I directed him to send for the detail, and to his surprise he found only one man on duty. I promptly sent an official communication to the division commander calling his attention to the neglect of duty. The offenders were punished and there was no more trouble with the policing of those grounds.

Care of Sinks.—At First Division Hospital, Camp Alger, we had five sinks besides those used by Hospital Corps; one for the officers of the hospital, one for the nurses, one for patients, one for venereal patients and one for depositing the stools of typhoids. These sinks were dug in the regulation manner and covered with fresh earth three times a day. Large signs designated the venereal and typhoid sinks. Besides the fresh earth and the disinfectants used in the bed-pans of typhoid stools, fresh lime was thrown in the sink where they were deposited, several times daily.

I do not think this system could be improved on; throwing typhoid stools in barrels and then emptying, necessitates more or less slopping. Besides, the barrel must be cleaned and this endangers the surroundings more or less, by spreading the bacilli, particularly where the work is entrusted to careless, indifferent or ignorant persons. Properly disinfected in the bed-pan, promptly buried in dirt and lime is the best and proper disposal of typhoid excreta. For the ordinary sink, no disinfectant is needed. Lime is a good deodorizer, but I think its free use in sinks may interfere with the absorptive powers of the natural soil. This interference with absorption of feces by the soil is no disadvantage unless the same ground is used again for sinks. If there is sufficient room, the sinks should be filled in and new ones dug every third day. To my mind, the regulation sink of the U. S. Army, properly cared for, cannot be improved on.

The following are essentially the rules of Dr. Fitz of Harvard, to be observed by attendants in the care of typhoid fever. They have given good satisfaction in my service at Carney Hospital and with slight modifications could be adopted for field hospitals:

- I. Mattresses and pillows (when liable to become soiled) are to be protected by close-fitting rubber-covers.
- II. Bed and body linen are to be changed daily. Bedspreads, blankets, rubber sheets and rubber covers are to be changed at once when soiled. Avoid shaking any of the articles.
- III. All changed linen, bath towels, rubber sheets and covers are to be immediately wrapped in a sheet soaked in carbolic acid (1-40). Remove them to the rinse-house as soon as possible, and soak six hours in carbolic acid (1-40). Then boil the linen for a half hour and wash with soft soap. The rubber sheets and covers are to be rinsed in cold water, dried and aired for eight hours. The bed spreads and blankets are to be aired eight hours daily.
- IV. Feeding utensils, immediately after using, are to be thoroughly cleansed in boiling water.
- V. Dejections are to be received into a bed-pan, containing half a pint of carbolic acid (1-20). The nates are to be cleansed with paper, and afterwards with a compress cloth, wet with carbolic acid (1-40).
- VI. Add two quarts of carbolic acid (1-20) in divided portions, to contents of bed-pan; mix thoroughly by shaking and throw the liquid into the hopper. The bed-pan and hopper are to be cleansed with carbolic acid (1-20) and wiped dry. The cloth used for above purpose is to be at once burned.
- VII. After the discharge of the patient from the hospital, the mattresses are to be aired every day for a week. The bedstead is to be painted.
- VIII. In case of death, the body is to be covered with a sheet, wet with carbolic acid (1-40).
- IX. Attendants should thoroughly wash hands in solution of corrosive sublimate (1-1000), after coming in contact with patient, bed-pans, etc.

Sprinkling grounds of hospital with a mild antiseptic solution would be advisable.

So much depends on the prompt detection of typhoid in its incipient stage, that I would recommend the following as a simple

and effective method to detect the disease in its early stage in regiments. The same method could be applied to the Hospital Corps at the Division Hospital. A nurse carrying with him the germs of disease could easily spread it to patients.

Take, for example, a regiment of 1300 officers and men just mustered into the United States service. Supplied with the dozen clinical thermometers and three assistants to act as clerks, the three medical officers could take the temperature of every soldier. The temperature of every man in the command could be ascertained in ten or twelve hours. All having a temperature over 101° should be classed as suspects and isolated; all between normal and 101° should be placed under strict observation. Had this method been adopted at state camps, many of the typhoids that disseminated the disease in the volunteer army could have been isolated and the spread of typhoid prevented to a considerable extent. The same method should be practiced once a week with the hospital corps and nurses at the hospital. A bacteriological laboratory well equipped in every Division Hospital would add greatly to its efficiency. For the detection of typhoid, the Widal test could be promptly applied to every suspect.

In connection with the management of a division hospital I cannot refrain from saying a word in regard to "red-tape." I fear that some of our volunteer surgeons have made light of a system which is as essential for the proper conduct of army work, as it is in any business house. "Red tape," properly used, aids the medical officer in his work and makes it easy. An officer who does not promptly and properly forward papers, brings "red tape" into disrepute. Take the "red tape" medical supplies with its invoices, receipts, etc.; every experienced officer knows how necessary it is. There is no need of cutting the tape as suggested by some. You can't expect the medical supply officer to dump all kinds of valuable goods on the field and take no receipt. In case of great urgency, common sense will assert itself, and no officer worthy the name will allow "red tape" to cause suffering. So much for "red tape," and I hope in the future every volunteer officer will receive thorough training in paper work. Even though he may never be called upon to use his knowledge in active service, it will be no burden to carry and will aid him in his ordinary business affairs.

IV. SOME STEPS IN THE ORGANIZATION AND INSTRUCTION OF THE MEDICAL DEPARTMENT OF THE THIRD CORPS, U. S. V.

By JOHN VAN RENSSELAER HOFF,

MAJOR, SURGEON, U. S. A. ; CHIEF SURGEON, DEPARTMENT OF PORTO RICO ; (FORMERLY LIEUT.-COL., CHIEF SURGEON, 3D. CORPS.)

GENTLEMEN—It has been said that ours is not a military nation. We will fight, when the fight is on, to the bitter end, but we have not yet learned, at least so far as our army is concerned, to heed the teaching of that wise adage, "In time of peace, prepare for war."

The United States Army, through no fault of its own, was in the beginning of 1898, unprepared for active service. Particularly was this so of the Medical Department, and more than with any other department in any army, is it likely to be so. In peace our functions are largely those of the family physician, with a military administrative adjunct, which in most cases is regarded as a bore, to be endured when it cannot be ignored. While in war, administrative duties are essential to success. The Military Medical Officer in peace must be a man of great imaginative powers; he must be willing to undertake much work, the immediate use of which is not apparent; he must not fear to subject himself to criticism, because of his apparent desire to be more of a soldier than a physician, if he does not wish to find himself very much of a stranger to his duties when he finally comes into the field of active service.

If this be so with those of us who divide our allegiance between Æsculapius and Mars, what possible chance under present circumstances has the physician in civil practice to learn anything of the duties of the Army Medical Officer in war? In illustration of how little is known here of the requirements of the Medical Department in active service, the following is cited:

The call to arms in April multiplied our fighting effective by ten and brought a quarter of a million men into the field.

To determine the medical requirements of such a force was a question of the simplest mathematics.

¹The average of all armies shows that we needed :

1479 Medical Officers.
 95 Transport Officers.
 2382 Non-commissioned Officers.
 10,475 Privates, Hospital Corps.

14,431

In view of the well defined requirements of Military Sanitary Organization, what provision in this direction was made for our army in the Spring of 1898? One looks in vain for any mention of a hospital corps in any law which called into existence, or organized the volunteer troops of our army of 1898, for such does not exist. The limit of the sanitary organization for this army, the very nature of which demanded the most ample provision in this direction, was three surgeons in each regiment, and, apparently as an after-thought, three hospital stewards.

The President's proclamation calling for volunteers made no mention of a hospital corps, because he had no authority to ask for enlistments in an organization which could have no legal existence.

1 For each Division 13,000 Strength.	Medical Officers.	Transport Officers.	Non-commis'n'd Officers.	Privates Hospital Corps.	
	53	3	100	408	At the front.
	24	2	24	137	On the line of communication and base.
	77	5	124	545	Total for 13000 men.
	5.92	.38	9.53	41	For each thousand.
6.68	.....		7.88	20.5	" " " in the U. S. Army, 1897.

See recapitulation of personnel and transportation of the sanitary organization of a division in active service.—Proceedings of the Association of Military Surgeons 1897, page 446.

Congress had taken, and would take, no action authorizing a volunteer hospital corps, and the position into which the Medical Department was thereby thrust at this critical moment, through no fault of its own, hampered its work during the entire war.

The failure of Congress to provide a hospital corps for our volunteers forced the Surgeon-General, as his sole resource, to

make use of the law of March 1, 1887, organizing the Hospital Corps, U. S. A., to transfer volunteers, often against their will, into the Hospital Corps of the regular establishment.

Finally we got the required number, but only through trials and tribulations, that almost entitle the Medical Officers to a martyr's crown; for the work they were called upon to accomplish with inadequate means was not equaled by that of any other department of the Army, and the only reward that has come to them is the consciousness of having done the best possible, under the worst possible conditions.

In May, 1898, the writer was commissioned Lieutenant-Colonel, Chief Surgeon, and assigned to the Third Corps to be organized at Chickamauga Park, Georgia.

No instructions having been received as to the form and method of organization of the Medical Department the following communication was addressed to the Chief Surgeon of the troops in the field:

WASHINGTON, D. C., May 16, 1898.

Chief Surgeon, Troops in the Field:

SIR—In view of my assignment as Chief Surgeon of some Volunteer Army Corps now organizing at Chickamauga, I have the honor to request instructions upon the following points, viz.:

Is the sanitary force of said corps to be organized by transfers from the line companies thereof or from other sources of recruitment? If the latter, what source?

If by transfer, how is this transfer to be affected, and have the necessary instructions yet issued from the War Department covering this point?

Who is authorized to appoint the non-commissioned officers (Stewards and Acting Stewards), and what will be the *modus operandi*?

Upon my arrival at Chickamauga, shall I at once proceed to organize the Medical Department of my corps, asking the commander thereof to make temporary details of those who deserve to, and are recommended for, transfer to the Hospital Corps? If not, where shall I obtain the necessary personnel to care for the actual sick?

Will I find on the ground the necessary medical and surgical material, the tentage, cooking utensils, subsistence, etc., all requisite to the care of the sick, or will it be necessary to make formal requisition upon the different departments for this material?

In event of necessity am I authorized to make emergency purchases?

Definite instructions covering the foregoing points will greatly facilitate the care of the actual sick and the permanent organization of the sanitary department.

Very respectfully,

(Signed) JOHN VANR. HOFF,
Lieut.-Col., Chief Surgeon.

To which the following reply was received :

HEADQUARTERS OF THE ARMY,
WASHINGTON, D. C., May 20, 1898.

To the Chief Surgeon, Third Corps:

SIR—I am directed by the Major General commanding the Army to enclose herewith a plan of sanitary organization for the troops in the field. It represents numerically the distribution of the personnel of the Medical Department and relative proportion of the necessary wheel transportation and tentage to the combatant force. It is a general standard from which departure may be made (in your discretion) to meet the exigencies of the camp or battle-field; in which case the fact and reasons therefor should be duly reported to the Chief Surgeon.

Your attention is invited to Circular No. 1 from the Surgeon General, dated April 25, 1898 (enclosed); on the subject of army sanitation; an observation of its requirements is particularly enjoined.

Another Circular will soon be issued from the same source detailing specifically the duties of the field administrative officers in the Medical Department.

Attention is also invited to the preparation and transmission of reports and records, the accuracy of which should be assured. For this purpose an ample supply of blank forms should be procured, and as soon as practicable, a school for officers of the Medical Department organized where instruction in the use of these forms and in the various military duties incident to the sanitary service may be given.

Frequent inspections of the hospitals, dispensaries and camps should be made by you in person, including a careful scrutiny of the methods and work of the medical officers within your jurisdiction. No specific orders are issued in this connection, as the Chief Surgeon desires to leave in your hands the responsibility for the proper performance of your duties.

Regarding the relation of unofficial civilian aid to the medical department, attention is invited to General Order No. 47, series 1898 (enclosed), and you are requested to inform the Division

Chief Surgeons that no permits for utilizing members of aid societies will be issued until the medical department makes formal call for their services. Very respectfully, Your obedient servant,

(Signed) CHAS. R. GREENLEAF,
Col., Asst. Surg.-Gen., U. S. A.; Chief Surgeon,
Army in the Field.

The plan of organization referred to provided a sanitary personnel as follows:¹

Sanitary subdivisions of a volunteer army corps (about 25,000 combatant strength based upon present organization), viz.:

24 Regiments of Infantry.

3 Light Batteries.

1 Regiment of Cavalry.

	Medical Officers.	Hospital Stewards.	Actg. Hosp. Stewards.	Privates.	Total for Corps.			
					M. O.	H. S.	A. H. S.	Privates.
Each Regt. of Infantry....	1	1		1	24	24		24
Each Art. Battalion (3 Light Batteries).....	1		3	1	1		3	1
Each Regt. of Cavalry.....	2	1		2	2	1		2
Total with troops....					27	25	3	27
<i>Administration.</i>								
1 Corps	2	1		2	2	1		2
3 Divisions	1	1		1	3	3		3
9 Brigades.....	1			1	9			9
Total with Administration.....					14	4		14
3 Division Ambulance Companies and 1 Corps reserve company each.....	6	7	3	104	24	28	12	416
3 Division field hospitals (200 beds each) and 1 corps reserve hospital each	6	6	3	90	24	24	12	360
					48	52	24	776
Unassigned.....		2	2			2	2	
Grand Total.....					89	83	29	817

1. This scheme does not and evidently was not intended to provide for any sanitary organization on the lines of communication or at the base.

The sanitary organization of a corps of the regular establishment or one differing in combatant strength should be based upon this ratio.

Relative proportions of the necessary wheel transportation and tentage, to the combatant force of an army corps :

For wheel transportation—

- 1 Ambulance to 400 men.
- 1 Army wagon to 600 men.
- 1 Escort wagon to Brigade.

For tentage—

- 1 Hospital tent to 300 men.
- 1 Common tent to 1200 men.

The organization as set forth was based upon our own experience in 1861-1865 and the developments in that direction in other armies since. It is scientific, and is open to criticism only in one direction—its strength is inadequate to meet the demands of an army of recruits upon an untrained organization.

In practice the numbers proved utterly inadequate, owing to the misuse of the field division hospitals as fixed hospitals in which thousands of patients were constantly under treatment. By reference to the table of averages it will be seen that, under these circumstances, the organization should have been increased fifty per cent., as it was made to do the work of hospitals on the line of communication and at the base as well.

Major-General James E. Wade, who had been assigned to command the Third Corps, established his Headquarters in Chickamauga Park, May 24, 1898.

The excellent regiments which were to constitute this corps rapidly assembled. Each came with its surgeons and stewards, but without an authorized hospital corps detachment, though all had men detailed from the companies for hospital purposes. This was contrary to law, but was a necessity which "knows no law."

There was not a Division or Brigade Surgeon on the ground, nor did any report until some time after the corps was organized.

Following the lines laid down in the letter of the Chief Surgeon of the Army in the Field, a provisional divisional organization was at once made, regimental medical officers being assigned as chief surgeons of divisions and brigades, and commanding officers of division field hospitals and ambulance companies.

When finally the medical staff officers arrived on the ground, they fell into their places easily, but not naturally, for there was not one who had the remotest conception of the duties of his office.

This statement is equally true of the regimental medical officers and the hospital stewards, for in this vast mass of excellent crude material, there was scarcely an officer or man who possessed the slightest knowledge of medico-military matters, but they showed zeal and determination to learn their duties, which made my task as organizer and teacher pleasant, though arduous.

I had anticipated the demands for blanks by providing an ample supply, but next to the lack of medicines, nothing so handicapped the officers everywhere as the absence of field desks with the various books they contain. Truly my officers and men had for weeks to make "bricks without straw."

The following letter was sent to the Division Chief Surgeon :

HEADQUARTERS THIRD ARMY CORPS,
CHICKAMAUGA, GA., June 9, 1898.

The Chief Surgeon, ——— Division, Third Army Corps:

SIR—I am directed by the Corps Commander to enclose herewith the following official publications, the regulation requirements of which will be complied with, viz. :

1. Circular letter, Chief Surgeon, Army in the Field, May 20, 1898.
2. Official Scheme of Sanitary Organization.
3. Circular No. 1, W. D., Surgeon General's Office, April 25, 1891.
4. General Orders No. 47, c. s., War Dept., A. G. O.
5. Manual of the Medical Department.
6. Drill Regulations, Hospital Corps.
7. Circular of Information, Hospital Corps.
8. Field Supply Table, Medical Department.

You will at once proceed with the organization of the sanitary department of the ——— Division of this Corps in the prescribed manner, and will supply yourself with the necessary material by requisition upon the various supply departments.

The personnel of the sanitary department will be made up of the medical officers (regimental and other) of the division and of the hospital stewards and other men (if any) of the hospital corps. This corps will be organized in accordance with existing orders by transfer from the line of the division.

It is important that the men selected for transfer should be carefully chosen from among those who desire service in the hospital corps, and have aptitude therefor. They must be of excellent character, good physique, fair education and intelligence and capable of filling respectively the positions of pharmacists, nurses, cooks, clerks, drivers, mechanics, etc., and be able to read and write. The proportionate number of the different classes will be ascertained by a study of the plan of organization, but the standard of selection in all cases should be sufficiently high, so that most of the duties can be interchanged.

Many of the hospital stewards have, doubtless, already been appointed, and should be retained if capable. The acting hospital stewards should be selected from those who are especially efficient, and who have satisfactorily performed the duties of this position under temporary (lance) appointment.

In the interior economy of the ambulance company and field hospital the men should, so far as practicable, be divided into squads, each under its leader (see par. 52, D. R. H. C.), sections under non-commissioned officers, and divisions under officers.

Medical officers should be assigned by you ordinarily, by written orders to the various units, and the commanders of the units should assign the officers, non-commissioned officers, and men to specific duties in the same way, though, of course, all should do any additional work required of them.

You will at once submit a report on the details of the enclosed plan of organization in the ——— Division, together with the names of medical officers and non-commissioned officers whom you deem best fitted to fill the different positions, particular care being given to the selection of medical officers to command the field hospital and ambulance company, the most important features of the organization.

A limited supply of blank forms and other official publications may be obtained from the Chief Surgeon.

Laws, Regulations, and Orders for the government of the Army will be strictly complied with. Very respectfully,

(Signed) JOHN VAN R. HOFF,
Lieut.-Col., Chief Surgeon, Third Corps.

Immediately upon receipt of G. O. 58, W. D., A. G. O., May 31, 1898, the Corps Commander ordered the transfer to the hospital corps of thirty men from each regiment.

The regimental surgeons had previously been requested to select suitable men for this purpose, but the regimental commanders did not always heed the recommendations of their surgeons, and, strange to say, this was most marked in regiments commanded by officers of the regular establishment.

As a consequence, the crude material to constitute the hospital corps of the Third Army Corps was not above the average of the line, which, of course, it should have been; nevertheless we got many good men, and most of all, thanks to the wisdom of our Corps Commander, we got them all at the same time.

It will be seen from the foregoing that the medical department of this corps, at least, was quite as much in need of training in the theory of the very special military work of the sanitary corps, as were the troops of the line in their routine of "fours right and fours left." We had a lot of excellent physicians, but no medical officers; a number of trained pharmacists, but no hospital stewards.

The routine of the day was as follows :

1. The Regimental Medical Officer was daily required to attend sick call.

To recite one hour to his Brigade Surgeon in Army and Medical Department Regulations, and Drill Regulations of the Hospital Corps.

To make a rigid inspection of the camp and food of his regiment.

To submit a written report to the Brigade Surgeon.

2. The Brigade Surgeon was daily required to attend sick call at one of his regiments, to observe the condition of the men, the manner of conducting the duty, of caring for the patients, and keeping the records.

To formally instruct the Medical Officer of his brigade, at least one hour daily, in regulations and customs of the service.

To make a thorough sanitary inspection of the camps of his brigade.

To report in person to the Division Chief Surgeon at 10 a. m. with the consolidated sick report of his brigade.

To submit a weekly report on the sanitary condition of his command, in duplicate, one to be forwarded through military channels, and the other to the Chief Surgeon of the Corps through the Division Chief Surgeon.

3. The Division Chief Surgeon was daily required to report in person to the Corps Chief Surgeon, with a consolidated sick report of his division, and such other reports as he had to submit.

The very important duties of the Commanding Officers of the Division Field Hospitals and ambulance companies are set forth in detail in the accompanying circulars. They were required to report each day in person (with the Brigade Surgeons) to the Division Chief Surgeon, and with him constituted a board of examination for soldiers recommended for discharge on Surgeon's Certificate.

The Regimental Surgeons were detailed, by roster, as Medical Officer of the Day, and were required to inspect the sanitary condition of the entire camp.

A comprehensive course of instruction was devised and published in circular orders. As these circulars are the outcome of considerable experience in some of the many phases of military sanitary organization, they are presented to this Association in the hope that when it is realized that the Medical Department must have a closer military organization, and more detailed regulations covering, not only its peace, but its war work, these circulars may perhaps suggest something to add thereto, or something to avoid.

HEADQUARTERS THIRD CORPS,
OFFICE OF CHIEF SURGEON,
CHICKAMAUGA PARK, GA., June 19, 1898.

Circular No. 1.

The following is published for the information and guidance of the medical officers of this corps, viz.:

1. The Regimental Dispensary, as its name implies, is intended for the treatment of trivial cases only. All serious cases must be sent to the Divisional Hospitals. Every case excused from any duty whatsoever must be entered in the regimental register of sick and wounded and continued on that register, whether the patient be treated in quarters or Division Hospital, until it is disposed of by return to duty, discharge, death, desertion, or transfer to a General Hospital. It is of the utmost importance that this register be kept accurately, and that the report of sick and wounded, which is based upon the register, be rendered promptly, in which connection, particular attention is invited to the "Directions for preparing the register of patients" recently distributed to each regimental surgeon. This report must be rendered to this office within five days after the expiration of the month for which it is made.

2. The Regimental Hospital Stewards will ordinarily be mustered with their regiments. The private of the hospital corps

on duty as regimental orderly will be mustered with the ambulance company of his division.

3. In addition to the duties prescribed in Circular No. 3, Surgeon General's Office, May 18, 1898, for regimental surgeons, they should instruct the officers of the regiment in first-aid and the prescribed methods of transporting the wounded (see General Orders No. 60, Adjutant General's Office, Washington, D. C., series of 1897).¹

4. The Field Division Hospital, which is in effect made up from the different regimental hospitals, is the central medical feature of the division, and upon its effective administration depends the success of the medical department. It should be organized in three brigade sections, in such a way that one or more sections may be readily detached without destroying its entity, and so far as practicable, the sick of each brigade should be assigned to its designated section (see par. 9).

5. The duties of the medical officer commanding such a hospital are sufficiently outlined in the above referred to circular. Next to the care of the sick his most important duties lie in the keeping of the records, and the making of reports as prescribed in regulations and orders. The men of the hospital corps under his command look to him for subsistence, clothing, pay and instruction, which he is under obligations to see that they receive. In supplying the entire division with medical supplies, and in anticipating future requirements in this direction, care is demanded.²

6. The Division Ambulance Company in camp furnishes transportation for the sick, and such other assistance as may be required of it by proper authority. It is essentially a company of instruction to which all the men of the hospital corps in the division, except those attached to the Field Hospital, belong. On the march, it becomes an Ambulance Hospital, furnishing shelter as well as treatment for the sick. On the field of battle, it organizes the dressing and ambulance stations, it collects and transports the wounded from the field, and oftentimes acts in place of the Field Hospital when the latter fails to reach the battlefield. The function of this organization is exceedingly important, and, in our service, is yet largely undeveloped. The interior economy of the Ambulance Company is practically identical with that of a company of the line (see pars. 264 to 268, inclusive, Army Regulations, 1895). The standard of an Ambulance Company in celerity of movement, care of equipment, instruction of men, and general "smartness" should equal that of a light battery of artillery in the regular establishment.

¹ See Circular No. 2, Headquarters Third Corps, Office of Chief Surgeon, July 15, 1898, herewith.

² See Circular No. 3, Headquarters Third Corps, Office of Chief Surgeon, July 16, 1898, herewith.

7. The twenty-eight saddle horses at present allowed to a division will, until further orders, be distributed as follows, viz.:

Hospital Steward at Division Headquarters.....	1=1	
Orderly Steward at Division Headquarters.....	1=1	
Orderly for each Brigade Surgeon.....	1=3	
Orderly for each Medical Officer with Regiment.....	1=9	
Field Hospital.....	{ Trumpeter	1=1
	{ Senior N. C. O.....	1=1
	{ Transport N. C. O.....	1=1
	{ Asst. Transport N. C. O.....	1=1
	{ Commissary N. C. O.....	1=1
	{ Quartermaster N. C. O.....	1=1
Amulance Company.	{ Actg. Commissary Sergeant.....	1=1
	{ Trumpeter	1=1
	{ Orderlies, M. O's.....	1=3
	{ Senior N. C. O.....	1=1
	{ Actg. Q. M. Sergeant.....	1=1
	{ Transport Sergeant	1=1

The remaining non-commissioned officers and men of the Hospital Corps will walk. The Field Hospital forms part of the advance (fighting) train, and the Ambulance Company is distributed by brigade sections throughout the division.

8. In addition to the six medical officers attached, the Field Hospital numbers 99 N. C. O. and privates, and the Ambulance Company 114 N. C. O. and privates. Both of these organizations are divided into Brigade sections, each capable of independent action. Lieutenants of the line, detailed under the provisions of par. 2, General Orders No. 78, Headquarters of the Army, A. G. O., c. s., are attached to the Field Hospital and Ambulance Company, respectively. They act as quartermasters for their organizations. The combined divisional medical organizations are, in effect, a battalion, under the immediate command of the Division Chief Surgeon.

9. In addition to the sub-division of the Field Hospital into Brigade sections, it is divided into the medical and transportation departments, a train of seventeen four-mule wagons being required. The personnel of the Field Hospital is distributed as follows:

- 1 Medical Officer commanding.
- 5 Medical officers.
- 1 Quartermaster (lieutenant of the line).
- 6 Hospital stewards.
- 3 Acting hospital stewards.
- 90 Private soldiers, hospital corps.

Of this number—

- 1 Quartermaster.
- 2 Hospital stewards as train master and assistant.
- 1 Blacksmith.
- 1 Artificer.
- 1 Cook.
- 17 Drivers.

are assigned to the transportation department. In camp the quartermaster is the police officer.

The remaining personnel, except the Commanding Officer (who supervises everything), pertain to the medical department of the hospital and the duties are distributed as follows:

1. Executive Officer, who is in effect the adjutant of the organization. He aids in the work of supervision, has charge of all the records of the hospital, and all public property, except that pertaining to the quartermaster's department.

2. A Medical Officer is assigned to the special supervision of the subsistence department of the hospital. He superintends the drawing and issue of rations, the keeping of accounts, the issue of special stores, etc., etc., which, however, with skilled assistance, will take but a portion of his time.

These officers usually remain with the hospital whether operative or not. The other medical officers are assigned in charge of the wards and operating tent, and do such other additional work as may be necessary (see Circular No. 3, Surgeon General's Office, May 18, 1898). When the hospital is inoperative they may be temporarily attached to the Ambulance Company which then becomes the Ambulance Hospital.

The non-commissioned officers and privates will be distributed as follows:

- 1 Hospital steward (senior non-commissioned officer), whose duties are essentially those of a first sergeant. He looks after the management and material requirements of the 99 men of the organization.
- 1 Hospital steward in charge of dispensary.
- 1 Hospital steward in charge of mess.
- 1 Hospital steward in charge of property.
- 1 Hospital steward in charge of wards.
- 1 Actg. hosp. steward in charge of records.
- 2 Actg. hosp. stewards on duty in wards.
- 1 Private on duty as clerk.
- 1 Private on duty in property department.
- 35 Privates on duty as nurses.
- 2 Privates on duty as cooks.
- 2 Privates on duty as assistant cooks.
- 2 Privates on duty as cook's police.
- 26 Privates, on duty as police, special details, guards, etc.
- 1 Trumpeter.

The Ambulance Company is also divided into medical and transportation departments. Its wheel equipment consists of 25 ambulances and there is a train of four wagons. Its personnel is distributed as follows:

- 1 Medical officer commanding.
- 5 Medical officers.
- 1 Quartermaster (lieutenant of the line).
- 7 Hospital stewards.
- 3 Actg. hospital stewards.
- 104 Privates, hospital corps.

Of this number—

- 1 Quartermaster.
- 1 Hospital steward (Q. M. Sergeant), and
- 7 Privates... {
 - 4 Drivers.
 - 1 Cook.
 - 1 Blacksmith.
 - 1 Saddler.

are on duty with the train, which marches with the ambulances. The remaining personnel pertain to the medical department, for, as has been stated, the ambulances form the hospital of which the drivers and orderlies are an essential part. The duties are distributed as follows:

- 1 Medical officer, commanding.
- 1 Executive medical officer.
- 1 Subsistence medical officer.
- 3 Medical officers (one to each Brigade Section) in charge of patients. (Additional medical officers and Hospital Corps men may be detailed from the Field Hospital during the march, if such be found necessary.)
- 1 Senior non-commissioned officer (1st. sergeant).
- 2 Hospital stewards (ambulance sergeants).
- 1 Hospital steward (dispenser).
- 2 Hospital stewards (bearer sergeants):
- 1 Actg. hospital steward (commissary sergeant).
- 1 Actg. hospital steward (asst. ambulance sergeant).
- 1 Actg. hospital steward (bearer sergeant).
- 97 Privates... {
 - 1 Trumpeter (C. O.'s orderly).
 - 1 Cook.
 - 25 Ambulance drivers.
 - 25 Ambulance orderlies.
 - 40 Litter-bearers and station attendants.
 - 5 Orderlies.

The dressing station party consists of:

- 2 (or 3) Medical officers.
- 4 Non-commissioned officers.
- 15 Attendants.
- 2 Cooks (1 from transportation).
- 2 Orderlies.

The wagon train rendezvous here and the personnel may be utilized. The dressing station is divided into three sections:

- Receiving section and for slightly wounded..... {
 - 1 Medical officer.
 - 1 Actg. hospital steward (clerk).
 - 7 Attendants.
- Operating section..... {
 - 2 Medical officers.
 - 1 Hospital steward.
 - 6 Attendants.
- Mortally wounded section {
 - 2 Attendants (a chaplain may well be here).
- Dispensary..... 1 Non-commissioned officer.
- Kitchen..... 2 Cooks.

As soon as the dressing station is formed, the rest of the company moves forward and establishes an ambulance station at

the farthest point to the front, at which the ambulance wagons rendezvous, and between which and the dressing station they are constantly plying. Each ambulance has a driver and orderly, and a box beneath the driver's seat, in which are carried beef extract, tea, sugar, hard bread, etc., etc., and every fourth ambulance, which must be especially marked, will carry surgical supplies, as anesthetics, anodynes, antiseptics and dressings. Each ambulance should carry an axe, two hand-litters, two lanterns (one red), and a galvanized iron pail.

Ambulance Station Party—

- 1 Medical officer (if possible).
- 1 Non-commissioned officer.
- 1 Private.
- 1 Orderly.

The remaining officers and men—

- 2 Medical officers.
- 2 Hospital stewards.
- 1 Acting hospital steward.
- 2 Orderlies and
- 24 Privates.

with twelve hand-litters, and divided into two platoons, go out to render first-aid, and to gather up and bring in the wounded. When the work of collecting is completed, the company rendezvous at the Dressing Station, and when the work there is accomplished, and the wounded transferred to the Field Hospital by the ambulances, the company goes into camp near the hospital.

The Field Hospital is evacuated to the rear as rapidly as possible so that it may be free to move with the troops.

As under the provisions of the Geneva Convention the personnel of the medical department is neutralized if unarmed; nevertheless, as it is necessary to preserve order at a place where large numbers of unruly people are sure to congregate, a provost guard must be detailed from the line to maintain order and prevent interference with the work of the dressing station and hospital. If this is not done, arms should be issued to the hospital corps.

The medical equipment of the ambulance company is not officially prescribed, but is indicated by its special functions. All experience has taught that the pannier, or chest, is the most convenient form in which to carry the field medical equipment. The field supply table provides a very meagre outfit, which certainly will not meet the requirements of the situation, and must be supplemented from the hospital supplies, for, as has been stated, the dressing station will often substitute the field hospital. It is directed that in this corps, the equipment indicated in Circular No. 3 herewith be taken, if obtainable.

The duties of Brigade Surgeons and of the Chief Surgeons of Divisions are sufficiently outlined in Circular No. 3, Surgeon

General's Office, May 18, 1898, and orders from these Headquarters. These officers are of great importance and upon their devotion depends, to a large extent, the successful administration of the division.

As medical officers, as well as enlisted soldiers of the hospital corps, are in need of instruction in what may be called the military feature of their work, Division Chief Surgeons will organize schools of instruction for their officers, in which they will be carefully taught in the duties pertaining to their positions, from text-books and papers prescribed in a letter addressed to Division Chief Surgeons, dated June 9, 1898, also G. O. 58 and 76 c. s., A. G. O.

Schools for non-commissioned officers and privates of the hospital corps, with regiments, will also be organized, in which they will be instructed in the making out of the various reports, the keeping of the required records, etc.

The instruction in the Field Hospital and Ambulance Company must be of the most complete character, covering all points requisite to the making of a thorough sanitary soldier.

Finally, it should be remembered that the Field Hospital and Ambulance Company must be as mobile as the command to which they are attached, and no effort must be spared to place both of these organizations in condition to move at an hour's notice.

Very respectfully,

JOHN VANR. HOFF,
Lieut.-Col., Chief Surgeon, Third Corps.

HEADQUARTERS THIRD ARMY CORPS,

CHIEF SURGEON'S OFFICE,

CHICKAMAUGA PARK, GA., July 15, 1898.

Circular No. 2.

The following distribution of personnel and material of the Field Division Hospitals, of this corps, will be observed until further notice:

MEDICAL DEPARTMENT.

MEDICAL OFFICERS.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
1 M. O. Commanding	1			
1 M. O. Executive	1			
1 M. O. Subsistence	1			
3 M. O. Attending surgeons		1	1	1
NON-COM. OFFICERS.				
1 Hospital steward, senior.....	1			
1 Hospital steward, mess.....	1			
1 Hospital steward, property.....	1			
1 Hospital steward, wards.....		1		
1 Actg. hospital steward, records.....	1			
2 Actg. hospital stewards, wards.....			1	1
PRIVATES, H. C.				
1 Clerk	1			
1 Property man	1			
35 Nurses		12	11	12
3 Cooks		1	1	1
3 Asst. cooks.....		1	1	1
1 Trumpeter	1			
26 Police, canvasman, guards, etc.....		8	9	9
TRANSPORTATION DEPARTMENT.				
1 Quartermaster	1			
2 Hospital stewards (train masters).....		1	1	
1 Blacksmith	1			
1 Artificer	1			
1 Cook	1			
17 Drivers	2	5	5	5
Total.....	16	30	30	30
Wagons	2	5	5	5

When a Brigade Section is detached, additional officers and men, if necessary, will be attached thereto. At least one section will always be with headquarters.

In campaign, the material for a Field Hospital of this corps, capable of temporarily tenting and caring for 200 patients, together with its personnel of six officers and 99 men, is as follows:

	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Five wall tents (complete).....	2	1	1	1
Eighteen hospital tents complete.....		6	6	6
The men will occupy shelter tents, in which when struck, they roll a rubber blanket and clothing, see par. 199, Drill Regulations, H. C., and which roll will be carried in the wagons of their sections.				
18 Four-mule wagons complete, with animals, harness and extra parts, tools and material		6	6	6
3 Buzzacott's ovens, or Hunt's ranges.....		1	1	1
30 Days' allowance of medical supplies for Division (see below).....				
5 Days' rations (99 men), lbs.....		495	495	495
5 Days' short forage (83 animals), lbs.....		1245	1245	1245

TRANSPORTATION DEPARTMENT.

Each wagon will carry—

- | | |
|---------------------------------|---|
| 1 Extra tongue. | 1 Axe (wood). |
| 1 Extra coupling pole. | 1 Axe (pick). |
| 1 Extra double tree. | 1 Spade. |
| 1 Extra king bolt. | 1 Camp kettle. |
| 1 Extra tongue bolt. | 1 Mess pan. |
| 1 Whip. | 1 Lantern. |
| 1 Stable broom. | 1 Pound lantern candles. |
| 1 G. I. bucket. | 2 Open links, $\frac{1}{4}$ and $\frac{1}{2}$. |
| 75 Foot rope, $\frac{1}{2}$ in. | 1 Maul. |
| 1 Hatchet. | 1 Pot axle grease. |
| 1 Water keg. | 4 Brackets, for tent poles, etc. |
| 1 Curry comb. | 1 Horse brush. |

Each train will carry—

- 12 Extra axe helvcs, 200 feet picket rope, 12 extra pickaxe helvcs.

All but a few necessary tools, as monkey-wrenches, etc., will be carried by the Ambulance Company, at which the emergency repair work of the Hospital train, and the shoeing of its animals will be done.

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.

MEDICINES.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Acidum arseniosum, 1 mgm. tab. (125 in bottle)		2	2	2
Acidum boricum, 324 mgm. tab. (125 in bottle)		1	1	1
Acidum carbolicum, in 250 gm. bottles.....		6	6	6
Acidum nitricum, in 250 c. c. g. s. bottles....		1	1	1
Aconiti tinctura, 0.1 c. c. tablets (200 in bottle)		3	3	3
Acidum sulphuricum aromaticum, in 250 c. c. g. s. bottles.....		6	6	6
Æther, in 100 gm. tins.....		13	13	13
Ætheris spiritus compositus, in 250 c. c. bottles		2	2	2
Ætheris spiritus netrosi, in 500 c. c. bottles..		3	3	3
Alcohol, in 1 litre bottles.....		16	16	16
Ammonia aqua, 10 p. c. in 500 c. c. g. s. bottles		6	6	6
Ammonia spiritus aromaticus, in 250 c. c. bottles		4	4	4
Ammonii carbonas, in 250 gm. bottles.....		2	2	2
Ammonii chloridi trochisci (100 in bottle)....		6	6	6
Amyl nitris (5 drop pearls), 12 in box.....		1	1	1
Antipyrinum, 324 mgm. tablets, in 125 gm. bottles		6	6	6
Argenti nitras, in crystals, in 25 gm. bottles..		1	1	1
Argenti nitras fusus, in 25 gm. bottles.....		1	1	1
Atropinae sulphas, 0.65 mgm. hypodermic tablets, tubes		1	1	1
Belladonnae emplastrum, in 2 metre tins.....		3	3	3
Bismuthi subnitras, in 500 gm. bottles.....		6	6	6
Caffeinae citrata, in 25 gm. bottles.....		1	1	1
Camphora, in 500 gm. bottles		4	4	4
Cantharidis emplastrum, in 1 metre tins.....		3	3	3
Capsici tinctura, in 100 c. c. bottles.....		1	1	1
Chloral, in 500 gm. bottles.....		1	1	1
Chloroformum, in 100 gm., g. s. bottles.....		32	32	32
Cocainæ hydrochloras, 10 mgm. hypodermic tablets in 15 c. c. bottles		3	3	3
Cannabis indica tinctura 0.06 c. c. tablets....		3	3	3
Codeina, in 50 gm. bottles.....		6	6	6
Collodium, in 25 c. c. bottles.....		3	3	3
Copaibæ pilulæ comp. or tablets (500 in bottle)		3	3	3
Cupri arsenis, in 0.325 mgm. (200 in bottle), bottles, tablets		1	1	1
Digitalinum, in 1 mgm. hypodermic tablets (tubes)		1	1	1

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Continued.

MEDICINES.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Digitalis tinctura, 0.3 c. c. tablets (200 in bottle)		6	6	6
Emplastrum ferri (porous) in boxes of 24....		3	3	3
Ergotinum, 130 mgm. tablets (200 in bottle)..		1	1	1
Ferri chloridi tinctura, in 500 c. c. bottles....		3	3	3
Ferri pilulæ compositæ, (200 in bottle).....		6	6	6
Glycerinum, in 500 c. c. bottles.....		6	6	6
Glycyrrhizæ mistura composita, tablets (40 in bottle)		6	6	6
Guaiacolis carbonas, in 250 gm. bottles.....		3	3	3
Hydrargyri iodidum flavum, 10 mgm. tablets (200 in bottle).....		1	1	1
Hydrargyri chloridum mite, in 100 gm. bottles		6	6	6
Hydrargyri chlodium mite cum sodio tablets (200 in bottle)		6	6	6
Hydrargyri massa, 324 mgm. tablets (125 in bottle)		3	3	3
Hydrargyri unguentum, in 500 gm. jars.....		1	1	1
Hyoscyami pilulæ compositæ (200 in bottle)..		1	1	1
Ichthyolum, in 25 gm. bottles.....		3	3	3
Iodoformum, in 100 gm. bottles.....		4	4	4
Iodum, in 50 gm., g. s bottles.....		1	1	1
Ipecacuanha, 65 mgm. tablets (200 in bottle)..		3	3	3
Ipecacuanhæ et opii pulvis, 324 mgm. tablets (200 in bottle).....		3	3	3
Ipecacuanhæ extractum fluidum, in 250 c. c. bottles		1	1	1
Linimentum rubefaciens tablets (50 in bottle)		6	6	6
Magnesiæ sulphas, in 4 kilo. tins.....		3	3	3
Menthol, in 50 gm. bottles.....		1	1	1
Morphinæ sulphas, 8 mgm. tablets (100 in bottle)		1	1	1
Morphinæ sulphas, 8 mgm. hypodermic tablets (tubes).....		8	8	8
Nitroglycerinum, 0.65 mgm. hypodermic tablets (tubes).....		1	1	1
Oleum menthæ piperitæ, in 100 c. c. bottles...		1	1	1
Oleum ricini, in 1 litre bottles.....		16	16	16
Oleum terebinthinæ, in 1 litre bottles.....		4	4	4
Oleum theobromatis, in 250 gm. tins.....		1	1	1
Oleum tigllii, 0.006 c. c. tablets (100 in bottle).		1	1	1
Petrolatum spissum, 48.8 C., in 500 gm. tins..		1	1	1
Phenacetinum, 324 mgm. tablets (100 in bottle)		3	3	3
Pilulæ camphoræ et opii, (or tablets), 200 in bottle		6	6	6

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Continued.

MEDICINES.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Pilulæ carminativæ, (200 in bottle).....		3	3	3
Pilulæ catharticæ compositæ (or tablets), (200 in bottle).....		12	12	12
Pilulæ opii, 0.5 mgm. (200 in bottle) bottles..		2	2	2
Plumbi acetat, 130 mgm. tablets (100 in bot- tle)		3	3	3
Podophylli resina tablets		2	2	2
Potassa, in 25 gm. bottles.....		1	1	1
Potassii arsenitis liquor, in 250 c. c. bottles...		1	1	1
Potassii bromidum, 324 mgm. tablets, in 500 gm. bottles		4	4	4
Potassii et sodii tartras (pulvis), in 500 gm. bottles		4	4	4
Potassii iodidum, 324 mgm. tablets (200 in bottle)		3	3	3
Potassii permanganas, in 50 gm. bottles.....		3	3	3
Quininæ hydrochloras, 32 mgm. hypodermic tablets, tubes		6	6	6
Quininæ sulphas, 200 mgm. tablets or pills (500 in bottle)		32	32	32
Salol, 324 mgm. tablets (125 in bottle).....		3	3	3
Sinapis emplastrum, in 4 metre tins.....		13	13	13
Sinapis nigra (pulvis), in 500 gm. tins.....		3	3	3
Sodii bicarbonas, 324 mgm. tablets (200 in bottle)		3	3	3
Sodii bicarb. et menthæ pip. tablets, (250 in bottle)		3	3	3
Sodii boras, (pulvis) in 500 gm. bottles.....		2	2	2
Squibb's mixture, in 250 c. c. bottles.....		3	3	3
Sodii salicylas, 324 mgm. tablets (200 in bottle)		3	3	3
Strychninæ sul-has, tablets, 1.3 mgm.....		2	2	2
Veratri viridis tinctura, in 100 c. c. bottles....		1	1	1
Zinci oxidum, in 250 gm. bottles.....		1	1	1
Zinci sulphas, 324 mgm. tablets, (100 in bot- tle)		3	3	3
Zingiberis extractum fluidum, in 250 c. c. bot- tles		3	3	3
Warburg's tincture pills (100 in bottle).....		3	3	3
HYPODERMIC TABLETS.				
Apomorphinæ hydrochloras, tubes.....		2	2	2
Atropinæ sulphas, tubes.....		2	2	2
Cocainæ hydrochloras, tubes.....		2	2	2
Digitalinum, tubes		2	2	2
Hyoscyami hydrobromas, tubes		2	2	2
Morphinæ sulphas, tubes.....		2	2	2
Nitroglycerinum, tubes		2	2	2
Strychninæ sulphas, tubes.....		4	4	4

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Continued.

ANTISEPTICS AND DISINFECTANTS.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Antiseptic tablets, hydrargyri chloridum corrosivum (200 in bottle).....		6	6	6
Calcii chloridum, in 500 gm. w. m. bottles....		32	32	32
Hydrargyri chloridum corrosivum, in 500 gm. bottles		3	3	3
Trikresol, in 1 kilo. bottles.....		4	4	4
HOSPITAL STORES.				
Condensed milk, cans.....		32	32	32
Beef extract, in 100 gm. tins or jars.....		32	32	32
Brandy, in 1 litre bottles.....		8	8	8
Soap, castile, or its equivalent, kilos.....		3	3	3
Sugar, white, in 6 kilo. tins.....		1	1	1
Tea, in ½ kilo. tins.....		3	3	3
Whisky, in 1 litre bottles.....		8	8	8
Candles, wax, kilos.....		5	5	5
STATIONERY.				
Blank books, cap, 4 quire, No.....		1	1	1
Blank books, 8vo., 4 quire, No.....		1	1	1
Envelopes, official letter, No.....	100	100	100	100
Ink, writing, in 120 c. c. bottles.....		3	3	3
Ink, carmine, in 30 c. c. bottles.....		1	1	1
Mucilage		1	1	1
Pads, prescription, No.....		32	32	32
Pads, letter, No.....		4	4	4
Paper, blotting, qrs.....		1	1	1
Paper, writing, letter, qrs.....		16	16	16
Pencils, lead, No.....		8	8	8
Penholders, No.....		4	4	4
Pens, steel, gross.....		1	1	1
Pencils, indelible, with extra leads, No.....		6	6	6
Portfolio, with stationery blanks, etc, No....		1	1	1
SURGICAL INSTRUMENTS, APPLIANCES AND DRESSINGS.				
Bandages, gauze, sterilized, 144 in box, 3 sizes, gross.....		8	8	8
Bandages, plaster, gross.....		1	1	1
Case, surgeon's, 1 for each Medical Officer...	3	1	1	1
Bandages, rubber, 4 metres by 33 mm., No...		8	8	8
Bandages, suspensory, No.....		12	12	12
Case, emergency, No.....		1	1	1

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Continued.

SURGICAL INSTRUMENTS, APPLIANCES AND DRESSINGS.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Case, pocket, No.....		1	1	1
Cotton, absorbent, sterilized, in 1 kilo. pkgs., kilos.....		6	6	6
First-aid packets (each man carries one), No.		500	500	500
Gauze, sublimated, in pkgs., 8 metres, each, packages		500	500	500
Gauze, iodoform, in pkgs., $\frac{1}{2}$ metre, each, packages		50	50	50
Gauze, wire for splints, metres.....		10	10	10
Ligatures, catgut, sterilized, in pkgs., 3 sizes, No		200	200	200
Ligatures, silk, sterilized, in pkgs., 3 sizes, No.		200	200	200
Case, field operating.....	1			
Syringes, fountain		2	2	2
Hospital corps pouches.....		21	21	21
Orderly pouches	3	1	1	1
Muslin, unbleached, metres.....		13	13	13
Oakum or tow, kilos.....		6	6	6
Pins, assorted, papers.....		6	6	6
Pins, safety, 3 sizes, doz.....		12	12	12
Plaster, adhesive, on spools, 1 inch, No.....		16	16	16
Plaster, adhesive, on spools, 2 inch, No.....		4	4	4
Plaster, isinglass, in 1 metre rolls, metres....		3	3	3
Plaster of Paris, in 2 kilo. tins, kilos.....		6	6	6
Rubber sheeting, metres.....		6	6	6
Silk, oiled, in 5 metre rolls, metres.....		10	10	10
Splints, wire for, pieces.....		20	20	20
Sponges, compressed cotton, 4 doz. in box, boxes		20	20	20
Thermometers, clinical, No.....		2	2	2
Tourniquet, rubber, Esmarch's, No.....		3	3	3
Trusses, single, No.....		2	2	2
Syringes, hypodermic, No.....		2	2	2
Medicine droppers, No.....		6	6	6
Pencils, camel's hair, No.....		6	6	6
Sprinkler, iodoform, No.....		2	2	2
FURNITURE, BEDDING, AND CLOTHING.				
Basins, wash, hand, agate ware, No.....		3	3	3
Blanket cases, No.....		7	7	7
Blankets, gray, No.....		70	70	70
Desk, field, No.....	1			
Cots, folding, No.....		33	33	33
Tables, mess, No.....		1	1	1
Tables, bedside, No.....		5	5	5
Chairs, folding, small, No.....		1	1	1

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Continued.

FURNITURE, BEDDING AND CLOTHING.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Chairs, folding, arm, No.....		1	1	1
Bed sacks, No.....		33	33	33
Blankets, rubber, No.....		33	33	33
Pillow ticks, No.....		66	66	66
Pajamas, pairs.....		66	66	66
Socks, pairs.....		66	66	66
Chests, with hinges and padlocks, to carry medicines and other supplies.....		30	30	30
Mosquito bar, metres.....		33	33	33
Pillows, feather, No.....		6	6	6
Pillows, hair, No.....		33	33	33
Pillow cases, cotton, colored, No.....		66	66	66
Sheets, cotton, No.....		66	66	66
Shirts, cotton, No.....		33	33	33
Towels, hand, doz.....		20	20	20
Table, operating.....		1	1	1
MISCELLANEOUS.				
Boxes, pill, doz.....		4	4	4
Boxes, powder, doz.....		4	4	4
Brushes, for cleansing, No.....		4	4	4
Buckets, agate, 3 in nest, nests.....		6	6	6
Chest, commode, No.....		1	1	1
Chest, food, No.....		1	1	1
Chest, medical (Nos. 1 and 2), of each, No..		1	1	1
Chest, mess, No.....		1	1	1
Chest, sterilizing, No.....		1	1	1
Chest, surgical (Nos. 1 and 2), of each, No..		1	1	1
Corks, assorted, in bags of 12 dozen, doz....		8	8	8
Crutches, pairs.....		3	3	3
Cushions, rubber, small, No.....		1	1	1
Cushions, rubber, with open centre, No.....		1	1	1
Dippers, No.....		1	1	1
Envelopes for tablets. 5 by 6 cm., doz.....		30	30	30
Labels for vials, gross.....		1	1	1
Lantern glasses, extra, red or white as req., No.....		1	1	1
Lantern wicks as required, No.....		3	3	3
Lanterns, No.....		3	3	3
Litters, No.....		3	3	3
Litter slings, No.....		6	6	6
Medicine glasses, No.....		6	6	6
Paper, wrapping, brown, quires.....		1	1	1
Saw, hand, small, No.....		1	1	1
Sponges, bath, large, No.....		1	1	1
Syringes, penis, glass in case, No.....		24	24	24

THIRTY (30) DAYS' SUPPLY FOR 10,000 MEN.—Concluded.

MISCELLANEOUS.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Talcum (French chalk), 1 kilo. pkgs., kilo....		1	1	1
Test tubes, No.....		4	4	4
Vials, 30 c. c., doz.....		2	2	2
Medicine glasses, No.....		6	6	6

A Brigade Section of Instruction will be organized in each Division Hospital, in which all the material as herein laid down, will be provided and kept separate, so that the section will always be prepared for instant detachment.

The officers and men, as herein prescribed, will be exercised, one hour each day, except Saturday and Sunday, in rotation, in packing, unpacking, pitching, conducting and striking this Brigade Section of their Field Division Hospital.

Every man of the hospital corps will be properly uniformed, will wear leggings, and be equipped with canteen, haversack, clothing-roll and belt. A designated number of men will wear the hospital corps and orderly pouches herein provided.

The officers, non-commissioned officers and men must be assigned by name, in written orders, to the Brigade Sections and to a specific duty therein. Very respectfully,

JOHN VANR. HOFF,
Lieut.-Col., Chief Surgeon, Third Corps.

HEADQUARTERS THIRD ARMY CORPS,
CHIEF SURGEON'S OFFICE,

CHICKAMAUGA PARK, GA., July 16, 1898.

Circular No. 3.

The following distribution of personnel and material of the Ambulance Companies of this corps will be observed until further orders:

	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
SIX MEDICAL OFFICERS.				
1 M. O. Commanding.....	1			
1 M. O. Executive	1			
1 M. O. Subsistence	1			
3 M. O. Attending Surgeons.....		1	1	1
1 Quartermaster (Lieut. of line).....	1			
TEN NON-COM. OFFICERS.				
1 Hospital steward (1st. sergeant).....	1			
2 Hospital stewards (ambulance sergeants).....		1	1	
1 Hospital steward (dispenser).....	1			
1 Hospital steward (Q. M. sergeant).....	1			
2 Hospital stewards (bearer sergeants).....			1	1
1 Actg. hospital steward (commissary sergeant)	1			
1 Actg. hospital steward (bearer sergeant).....		1		
1 Actg. hospital steward (records).....	1			
104 PRIVATES.				
1 Trumpeter	1			
2 Cooks	1			1
2 Asst. cooks.....		1	1	
25 Ambulance drivers.....	1	8	8	8
38 Litter bearers and station attendants....	1	12	12	13
25 Ambulance orderlies.....	1	8	8	8
5 Orderlies	2	1	1	1
4 Wagon drivers.....	1	1	1	1
1 Blacksmith	1			
1 Saddler	1			
	19	34	34	34

When a Brigade Section is detached, additional officers and men, if necessary, will be attached thereto. At least one section will always be with Headquarters.

In campaign the material for an Ambulance Company is as follows:

	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
25 Ambulance wagons (2 mule).....	1	8	8	8
4 Ambulance wagons (4 mule).....	1	1	1	1

Each Ambulance must carry:

- | | |
|------------------------------|-----------------------|
| 1 Extra king bolt. | 2 Pair litter slings. |
| 1 Whip. | 2 Hand-litters. |
| 1 G. I. bucket. | 1 Ambulance guidon. |
| 1 Hatchet. | 1 Camp color. |
| 1 Pot axle grease. | 1 Curry comb. |
| 1 Monkey wrench. | 1 Horse brush. |
| 2 Lanterns (1 white, 1 red). | 1 Split link. |
| 2 Pounds lantern candles. | 1 Water tank. |

NOTE.—Ambulances Nos. 1 and 5 of each Brigade Section, will carry an extra pole and a travois, instead of the litters. They will also carry dressings, etc., and the other ambulances, hospital stores as herein described.

Each wagon must carry:

- | | |
|-----------------------|---------------------------|
| 1 Extra tongue. | 1 Lantern. |
| 1 Extra double tree. | 1 Coupling pole. |
| 1 Tongue bolt. | 1 Extra king bolt. |
| 1 Stable broom. | 1 Whip. |
| 1 Hatchet. | 1 Bucket. |
| 75 Feet rope, ½ inch. | 1 Pot axle grease. |
| 1 Pickaxe. | 1 Wood axe. |
| 1 Camp kettle. | 1 Spade. |
| 1 Mess pan. | 1 Pound lantern candles. |
| 1 Water keg. | 2 Open links, ¼ and ½ in. |
| 2 Mauls. | 1 Curry comb. |
| | 1 Horse brush. |

The blacksmith's and saddler's tools will, so far as practicable, be carried, each set in a specially prepared chest, in the Headquarter's wagon.

BLACKSMITH'S TOOLS.

- | | |
|--------------------------|-----------------------------|
| 1 Portable forge. | 25 Horseshoe nails, 2 inch. |
| 1 Vice, blacksmith's. | 12 Extra axe helves. |
| 2 Pincers, paring. | 12 Extra pickaxe helves. |
| 2 Hammers, shoeing. | 1 Anvil. |
| 2 Hand hammers. | 1 Hammer, sledge. |
| 3 Pairs tongs, assorted. | 2 Nippers. |
| 1 Cold chisel. | 4 Rasps, 16 inch. |

BLACKSMITH'S TOOLS—Concluded.

- | | |
|-----------------------------|--|
| 1 Whetstone. | 2 Knives, farrier's. |
| 2 Aprons. | 2 Pritchets. |
| 2 Monkey wrenches. | 1 Splitting chisel. |
| 1 Drawing knife. | 1 Hand punch, round, $\frac{1}{4}$ in. |
| 1 Hardie. | 1 Brace ratchet. |
| 2 Clinch cutters. | 1 Steel square. |
| 50 Mule shoes, 4 inch. | 6 Bit braces, 2 each, 3-3, $\frac{1}{2}$, $\frac{5}{8}$. |
| 100 Mule shoes, 3 inch. | 1 Clamp carriage. |
| 50 Mule shoes, 2 inch. | 1 Saw, crosscut, 26 inches. |
| 25 Horseshoe nails, 7 inch. | 2 Clinching irons. |
| 25 Horseshoe nails, 6 inch. | 300 lbs. blacksmith's coal. |
| 25 Horseshoe nails, 4 inch. | 200 Feet picket rope. |
| 25 Horseshoe nails, 3 inch. | |

SADDLER'S TOOLS.

- | | |
|-------------------------------------|---|
| 1 Rivet set. | 1 Riveting hammer. |
| 1 Gauge knife. | 1 Shoemaker's knife. |
| 1 Revolving punch. | 1 Pair cutting nippers. |
| 6 Awls, stitching, assorted. | 12 Needles, stitching. |
| 1 Bar round iron, $\frac{3}{8}$ in. | 1 Bar round iron, $\frac{1}{2}$ in. |
| 1 Side harness leather. | 1 Side bridle leather. |
| 1 Side lace leather. | $\frac{1}{2}$ Pound shoemaker's thread. |
| 4 Oz. wax, shoemaker's. | 4 Oz. beeswax. |
| 10 Pairs hames, wagon. | 20 Pounds castile soap. |
| 2 Sponges, coarse. | |

Carried in Headquarter's wagon, Ambulance Company:

- | | |
|---|---|
| 25 Carriage bolts, 3-16x3 in. | 25 Carriage bolts, $\frac{3}{8}$ x3 $\frac{3}{4}$ in. |
| 25 Carriage bolts, $\frac{1}{2}$ x3 $\frac{3}{4}$ in. | 25 Carriage bolts, $\frac{1}{2}$ x4 in. |
| 9 Carriage bolts, $\frac{1}{2}$ x12 in. | 25 Carriage bolts, $\frac{1}{2}$ x6 in. |
| 500 Open links, $\frac{1}{4}$ inch iron. | 500 Open links, $\frac{1}{2}$ inch iron. |

Camp equipage and other material will be carried in the four wagons as follows:

	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
3 Hospital tents (dressing station).....		1	1	1
3 Hospital tents, flies.....		1	1	1
3 Hospital tent ridge poles.....		1	1	1
6 Hospital tent upright poles.....		2	2	2
5 Wall tents	2	1	1	1
5 Wall tent flies	2	1	1	1
5 Wall tent poles (ridge).....	2	1	1	1
10 Wall tent poles (upright).....	4	2	2	2
220 Tent pins, large.....	40	60	60	60
400 Tent pins, small.....	100	100	100	100
3 Hospital flags, with halyards and pole...		1	1	1
3 National flags (storm), with halyards and pole.....		1	1	1

The men will occupy shelter tents in which, when struck, they roll a rubber blanket and their clothing (see par. 199, Drill Regulations, H. C.), and which will be carried in the wagons of their sections.

	Hdqrs.	Brigade Sections.		
		1st.	2nd.	3rd.
5 Days' rations (114 men), pounds.....	428	428	428	428
5 Days' short forage (81 animals), pounds....	911	911	911	911
Officers' baggage, pounds.....	450	150	150	150
MEDICAL SUPPLIES.				
Medical chests (Nos. 1 and 2), set.....		1	1	1
Surgical chests (Nos. 1 and 2), set.....		1	1	1
Sterilizing chests, set.....		1	1	1
Operating table, No.....	1			
Field operating case, extra, No.....	1			
Surgeon's field case, No.....	3	1	1	1
Bandages, gauze, gross.....		4	4	4
Bandages, plaster, gross.....		1	1	1
Bandages, rubber, No.....		2	2	2
Bandages, suspensory, No.....		12	12	12
Cotton, absorbent, sterilized, kilo.....		7	7	7
First-aid packets, No.....		333	333	333
Gauze, sublimated, pkgs.....		333	333	333
Gauze, iodoform, pkgs.....		70	70	70
Ligature, catgut, sterilized, pkgs.....		200	200	200
Ligature, silk, sterilized, pkgs.....		200	200	200
Medicine droppers, No.....		6	6	6
Muslin, unbleached, metres.....		10	10	10
Oakum, kilos.....		7	7	7
Pencils, camel's hair, No.....		6	6	6
Pins, common, pkgs.....		7	7	7
Pins, safety, doz.....		7	7	7
Plaster, adhesive, 1 inch, spools.....		17	17	17
Plaster, adhesive, 2 inch, spools.....		4	4	4
Plaster, isinglass, metres.....		3	3	3
Plaster of Paris, kilos.....		6	6	6
Sheeting, rubber, metres.....		3	3	3
Silk, oiled, 5 metre rolls, rolls.....		7	7	7
Sprinkler, iodoform, No.....		1	1	1
Splints, wire for, pieces.....		20	20	20
Syringes, hypodermic, No.....	1			
Sponges, compressed cotton, boxes.....		20	20	20
Syringes, fountain, No.....		3	3	3
Tourniquet, Esmarch's, No.....		2	2	2
Thermometers, clinical, No.....		1	1	1
Basins, wash, hand, No.....		4	4	4

MEDICAL SUPPLIES.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Blanket cases, No.....	1	8	8	8
Blankets, gray, No.....		50	50	50
Blankets, rubber, No.....		50	50	50
Desks, field, No.....				
Bed sacks, No.....		70	70	70
Pillow ticks, No.....		70	70	70
Towels, hand, doz.....		10	10	10
Brushes for cleansing hands, No.....		4	4	4
Buckets, agate, nests of three, nests.....		1	1	1
Chests, commode, No.....		1	1	1
Chests in which to pack dressings, No.....	2	2	2	
Chests, mess, No.....	1	1	1	
Chests, food, No.....	1	1	1	
Dippers, No.....	1	1	1	
Lanterns, No.....	2	2	2	
Lantern wicks, No.....	6	6	6	
Litter slings, No.....	14	14	14	
Litters, hand, No.....	7	7	7	
Portfolio with stationery and blanks, No....	1	1	1	
Pencils, indelible, No.....	1	1	1	
Pouches, orderly, No.....	3	1	1	
Pouches, hospital corps, No.....		1	1	
Table, operating, No.....	22	22	22	
Table, mess, No.....	1			
Table, bedside, No.....	1	1	1	
Table, bedside, No.....	5	5	5	
Chairs, folding, small, No.....	1	1	1	
Chairs, folding, arm, No.....	1	1	1	
Emergency cases, No.....	1	1	1	
Pajamas, pairs.....	33	33	33	
Socks, pairs.....	33	33	33	
Saw, hand, small, No.....	1			
Sponges, bath, large.....		2	2	
HOSPITAL STORES.				
Condensed milk, cans.....		32	32	
Beef extract, 100 gm. tins, tins.....		32	32	
Brandy, 1 litre bottles, bottles.....		8	8	
Soap, castile, kilos.....		3	3	
Sugar, white, in 6 kilo tins.....		2	2	
Tea, in ½ kilo. tins, tins.....		4	4	
Whisky, in 1 litre bottles, bottles.....		8	8	
Candles, wax, kilos.....		2	2	
Matches, boxes.....		12	12	
ANTISEPTICS.				
Antiseptic tablets (200 in bottle), bottles.....		6	6	
Trikresol in 1 kilo. bottles, bottles.....		2	2	

MEDICINES.	Hdqrs.	Brigade Sections		
		1st.	2nd	3rd.
Alcohol, 1 liter bottles, bottles.....		2	2	2
Acidum carbolicum (250 gm. bottle), bottle...		2	2	2
Æther, 100 gm. tins, tins.....		12	12	12
Ammoniæ spiritus aromaticus, in 250 c. c. bottles		12	12	12
Chloroformum, 100 gm. g. s., bottles.....		12	12	12
Collodium, 25 c. c. bottles, bottles.....		3	3	3
Digitalis, tinct., 0.3 c. c. tablets (200 in bottle), bottles		3	3	3
Iodoformum, 1.00 gm. bottles.....		4	4	4
Petrolatum spissum, 48.8 C., in 500 gm. tins..		1	1	1
Pil. carminative (200 in bottle), bottle.....		2	2	2
Pil. comp. cathartic (200 in bottle), bottles...		2	2	2
Guininae sulphas, 200 mgm. tablets, bottles...		6	6	6
Salol, 324 mgm. tablets, bottles.....		1	1	1
Sinapis emplastrum, 4 metre tins, tins.....		2	2	2
Squibb's mixture, in 250 c. c. bottles, bottles..		1	1	1
HYPODERMIC TABLETS.				
Apomorphinæ hydrochloras, tubes.....		1	1	1
Atropinæ sulphas (65 mgm.), tubes.....		1	1	1
Cocainæ hydrochloras, 10 mgm., 15 c. c., bottles		1	1	1
Digitalinum, 1 mgm. tablets, tubes.....		1	1	1
Hyoscinæ hydrobromas, 0.65 mgm., tubes....		1	1	1
Morphinæ sulphas, 8 mgm., tubes.....		8	8	8
Nitroglycerinum, 0.65 mgm., tubes.....		1	1	1
Quininæ hydrochloras, 32 mgm., tubes.....		1	1	1
Strychinæ sulphas, 1 mgm., tubes.....		4	4	4
HOSPITAL STORES TO BE CARRIED BY AMBULANCES NOS. 2, 3, 4, ETC.				
Condensed milk, cans.....		12	12	12
Beef extract, tins.....		24	24	24
Brandy, 1 litre bottles, bottles.....		1	1	1
Sugar, white, 6 kilo. tins, tins.....		1	1	1
Tea, in ½ kilo. tins, tins.....		2	2	2
Biscuit, 1 kilo. box, box.....		1	1	1
Whisky, 1 litre bottles, bottles.....		1	1	1
Matches, boxes.....		1	1	1

MEDICINES, DRESSINGS, ETC., TO BE CARRIED BY AMBULANCES NOS. 1 AND 5.	Hdqrs.	Brigade Sections		
		1st.	2nd.	3rd.
Antiseptic tablets, bottles.....		1	1	1
Bandages, gauze, sterilized, gross.....		1	1	1
Bandages, plaster, doz.....		2	2	2
Cotton, absorbent, sterilized, kilos.....		1	1	1
First-aid packets, No.....		6	6	6
Gauze, sublimated, pkgs.....		50	50	50
Gauze, iodoform, pkgs.....		25	25	25
Gauze, wire for splints, metres.....		2	2	2
Ligature, catgut, sterilized, No.....		50	50	50
Ligature, silk, No.....		50	50	50
Syringes, fountain, No.....		1	1	1
Oakum, kilos.....		1	1	1
Pins, assorted, papers.....		1	1	1
Pins, safety, doz.....		1	1	1
Plaster, adhesive, 1 inch spools, spools.....		2	2	2
Plaster, adhesive, 2 inch spools, spools.....		1	1	1
Plaster, isinglass, rolls.....		1	1	1
Sponges, compressed cotton, box.....		1	1	1
Medicine glasses, No.....		1	1	1
Chloroformum, 100 gm. g. s. bottles, bottles..		2	2	2
Morphinæ sulphas, tablets, 8 mgm. (100 in bottle)		2	2	2
Matches, box		1	1	1

All the material herein laid down will be provided, and so much of it as is not needed for current use will be kept separate and packed in such manner that the Ambulance Company, or any part of it, can be mobilized at the shortest notice.

The company will be frequently practiced in pitching and breaking camp, organizing dressing and ambulance stations, and in such other work as it will be called upon to do on the march and battle-field. The officers, non-commissioned officers and men must be assigned by name, in written orders, to the Brigade Sections, and to their stations on the battle-field.

Every man of the Ambulance Company will be properly uniformed, will wear leggings, and be equipped with canteen, haversack and belt.

A designated number of men will wear the litter slings and hospital corps and orderly pouches herein provided.

JOHN VANR. HOFF,
Lieut.-Col., Chief Surgeon, Third Corps.

The Third Corps never heard a hostile shot fired, and finally, with the coming of peace, its members disappeared amongst the vast civil community from which they came. Its medical officers are now, I trust, enjoying, in civil life, the honors and emoluments they so well deserve. Their service was short, but severe, and no battle would have made greater demands than they were daily forced to meet in their struggle against the most insidious of all enemies, disease. What they learned of the multifarious duties of the military medical officer during their short service, it is hoped has so impressed them that each will insist that in future wars, our medical department will have a fairer start in the race.

San Juan, Porto Rico, September 27, 1899.

V. THE MEDICAL DEPARTMENT OF THE NATIONAL GUARD ITS OWN QUARTERMASTER.

BY WM. M. JOHNSTON,

LATE MAJOR AND SURGEON, U. S. V.

AT the sixth annual meeting of this Association, held in Philadelphia, his honor, the Governor, Danl. H. Hastings, made use of the following language in his address of welcome: "I hope the time will never come when you will be called upon to perform these duties in which you are being educated. I hope the time will never come when we shall be compelled to go to war. The best way to prevent war is to be ready for war. We do not know how soon the time will come when we shall be called upon to go to war."

Little did we think as we heard him make this last statement that before two short years should roll around, we should be called, and when called how many of us were prepared for war. Let each answer for himself.

But the National Guard surgeon went with his command, and oh! what a difference we found from our summer encampments. How often did we think we should be supplied with this, that or the other? How often deem delay inexcusable? How often when we wanted water hauled, be informed by the Quartermaster that the teams were busy hauling wood? How many things were there to disappoint us when we were putting forth our best endeavors to do our whole duty? And while in this mood the thought came to me: How much more rapidly and how much more easily could we accomplish many things pertaining to the Medical Department, had we a Quartermaster's Department and Quartermasters (Surgeons, I mean) strictly within the Medical Department?

Let the Medical Officer, of whatever rank may be decided upon, after making his requisition and having it approved by the Surgeon-General, proceed in the same manner to buy and dispense anything and everything that is required in the department of which he is Quartermaster.

My object is not to censure or find fault with the Quartermaster's Department or Quartermasters, but to expedite matters and to avoid the annoying and troublesome delays within our own department.

Now, the question arises, Can this be done? If done, will it be a betterment of the service? Think it over, gentlemen. Discuss it if you will and give us your verdict. If you will do this then I have accomplished my object in presenting this paper for your consideration.

Willingly do I leave this matter with you, knowing full well that the gentlemen of this Association are here met for the promulgation and furtherance of ideas that will redound to the betterment of our Department.

VI. REMARKS UPON THE GUNSHOT WOUNDS OF THE REDUCED CALIBER RIFLES IN THE SANTIAGO CAMPAIGN.

By MAJOR LOUIS A. LA GARDE,

SURGEON, U. S. ARMY, COMMANDING BASE HOSPITAL, 5TH ARMY
CORPS, SIBONEY, CUBA.

OUR knowledge of the rifles of reduced caliber propelling armored projectiles dates from the publication of Professor Hebler's pamphlet in 1882. In his original monograph Hebler claimed certain advantages for the reduced caliber rifle, and among these were the following:

1. Lighter ammunition.
2. Flatter trajectory and greater danger-space.
3. Less deviation by wind.
4. Less recoil.
5. Greater penetration.
6. Greater accuracy.
7. The wound produced, while being sufficient to disable, is much more humane.

Some of these advantages were so apparent that they could not be refuted, while the others required the proof by experiments, or the test by the actual conditions in the field.

That the ammunition is lighter there is no doubt, since a soldier who carries 100 rounds of the older ammunition, can carry for the same weight about 180 of the new ammunition. That the trajectory of the new rifle is flatter, and that the danger-space is consequently greater is also apparent, since those versed in ballistics have shown us that the point blank range of the older gun of the Springfield pattern is 300 yards and that of the Krag-Jorgensen rifle, our present service gun, is about 570 yards.

The advantage of less recoil is perfectly apparent to anyone who will shoot the two last named weapons one after the other. The remaining advantages claimed by Hebler were not so readily determined. Greater accuracy and less deviation by wind had

to be determined by comparison at target. Although the small-bore guns and ammunition have been perfected very much of late, it is yet a fact that in the remote ranges, the smaller and lighter projectile is more influenced by wind than the heavier and larger leaden bullet, and that for these ranges it is not so accurate.

Greater penetration was another important advantage claimed by Hebler, and this was sustained by experiment. In unseasoned oak, firing across the grain, three feet from the muzzle, the old leaden 45-caliber bullet from the Springfield rifle penetrates but 5 to 6 inches, whilst the steel-jacketed bullet of our present rifle, at the same distance, will penetrate 19 to 20 inches.

The last of the advantages claimed by Hebler, and the one of greatest interest to mankind, was that the wound produced, though sufficient to disable, is much more humane. This claim could be determined only by experiments on cadavers, lower animals, and the actual conditions in battle. Experimenters set to work in all the countries from 1886 to the present time to ascertain the character of the wounds, 1, on lower animals; 2, on dead human bodies. The Surgeon-General of the Austrian Army, Johann Hobart; Chauvel and Nimier, of the French Army; Bruns, of Germany, and many others have furnished us important data upon the effects of the new arm. In this country, it was my good fortune to be able to test the rifle for the War Department in 1893.

Although there was some difference in the mechanism of the guns used by the different experimenters, the projectiles which they propelled differed but little as to caliber and destructive effects. The most of the experiments were conducted at simulated ranges, whilst some few were conducted at the actual ranges. That is to say, taking our work at Frankford Arsenal as example, all of the firing was done at 53 feet. When we desired to obtain the effects of a bullet at a certain range, the charge of powder was reduced in quantity enough to give the bullet the remaining velocity for that range. The results thus obtained were generally uniform, and as far as the experimenters were concerned, sufficiently conclusive.

On the other hand, there were many writers who doubted the propriety of adopting these results as similar to those which must eventually obtain on the living subject at actual ranges in battle.

Inasmuch as we are now in possession of the accumulated experience of a few wars, it would seem pertinent at this time to study the results of the experiments and the conditions seen in battle side by side.

I will now review in detail the conclusions summed up at the end of our experimental work at Frankford Arsenal and compare them with what I observed in the Santiago campaign:

1. The experimental evidence showed that "the shock impressed upon a member increases with the velocity, whether a bone is traversed or not. It is always greater with the leaden projectile."

This diminution in shock has been one of the serious objections advanced by military men against the adoption of the small bullet. They feared that one wound would not suffice to put a man hors du combat, and that he might be able to go on fighting regardless of the fact that he had been hit a number of times. Whether this be true of savage tribes or horses in a cavalry charge, it is not true of our American soldiers. Upon inquiry among line officers in the Santiago campaign, I find that as a rule, to which there were very few exceptions, men when hit fell back to the rear at once; and I can testify to the fact that scores of them walked back to the hospital at Siboney with wounds that were most trifling in their nature.

2. "The explosive effects at very short range are about the same for the two projectiles. They continue, however, up to 350 yards with the smaller bullet and cease at about 200 yards with the leaden bullet."

I saw only one case in Cuba which approached anything like explosive effects. That was the case of a Captain of the Rough Riders, shot in the lower third of the tibia. The wound of entrance was about the caliber of the Mauser bullet that had inflicted it, and the wound of exit was irregularly round, a half inch in diameter. There were two smaller wounds near the wound of exit, which were undoubtedly made by spiculæ of bone which had been driven forth acting as secondary missiles. The area of fracture was about four inches above the ankle; it was marked by a cavity in which many loose fragments of bone lay, none of them measuring more than a half inch. The wall of the cavity showed bone sand driven into the soft parts. The infre-

quency of explosive effects should, in my opinion, be attributed, 1, to the fact that the vast majority of the wounds were inflicted beyond the zone of explosive effects, and, 2, since explosive effects are chiefly to be noted in the vital parts contained in rigid walls, like the brain, or in those organs containing much fluid, like the heart, liver, spleen, and alimentary tract, these wounds with explosive effects, so destructive to tissue, were commonly fatal, and the surgeon has no time to study the dead on the battle field.

3. The experimenters found that, "the smaller frontage of the jacketed bullets causes them to inflict something after the manner of subcutaneous wounds when the soft parts alone are traversed, and that the small wounds of entrance and exit and the narrow track of the missiles were favorable circumstances to rapid healing."

The truth of this statement is borne out by the experience of all surgeons in the Santiago campaign. Flesh wounds healed very kindly and rapidly.

4. This conclusion of the experimenters refers to hemorrhage. Johann Hobart, of the Austrian Army, who paid special attention to this subject, states, "that the blood vessels are seldom torn by the small jacketed bullet, and that when wounded they are not closed so easily by coagulation as those severed by leaden projectiles."

Some writers have deduced from this statement that alarming or fatal hemorrhage would be more frequent in future battles. The experience of the surgeons with the line before Santiago does not confirm these apprehensions. Of the 1400 wounded, so far as I can learn, not one died of external hemorrhage. The brachial and femoral were tied a few times in the Base Hospital for diffuse aneurysm. One case of wound in the subclavian was operated upon in New York and died after the operation. There were five cases of gangrene from injury to blood vessels, which required amputation.

5. "Injuries inflicted outside the zone of explosive effects upon the shafts of the long bones, always show less comminution with the small bullet of hard exterior. The fissures are often subperiosteal and the fragments are larger."

This was true of the Mauser bullet wounds in Cuba. It was seldom necessary to open up the wounds for the purpose of taking out loose fragments of bone. In a number of instances there was distinct guttering of the compact substance of long bones without fracture. The mobility in some instances was so slight that it was difficult to make out a complete fracture, when, from the location of the wounds, it was certain that the bone had been perforated.

6. "Beyond the zone of explosive effects, the projectiles of hard exterior almost invariably perforate or gutter the joint ends of bones, and the lesions of articulations are never so grave."

This conclusion tallies exactly with what we saw in Cuba. I do not recall a formal excision of a joint for the mechanical effects of the Mauser bullet. Joints were opened to turn out blood clots, and in one instance of the knee I particularly remember, to locate a lodged ball, but never for the purpose of performing an excision. There were at least 20 cases of gunshot injury of the knee joint alone. These were immobilized and shipped North; and so far as I have been able to ascertain, they have done well. These results are in great contrast to those inflicted by the larger leaden bullet, which, by its highly destructive effects, must have caused a number of resections and amputations.

7. "The projectiles of hard exterior lodge less frequently in the tissues than the old leaden bullet."

The experience at Santiago among the wounded of both sides, has shown a surprisingly large number of lodged balls. Although I am not prepared to state that the small caliber bullet lodges as often as the old discarded leaden bullet, the frequency with which it did lodge was remarked upon by military surgeons generally. Dr. W. E. Parker, of New Orleans, an Acting Assistant Surgeon in the Base Hospital, visited the Spanish Hospitals in Santiago after the surrender, and in conversation with the Spanish surgeons he learned that our Krag-Jorgensen bullet had not lodged in their wounded as often as their Mauser bullet had lodged in our men. The explanation for this would seem simple enough. It should be remembered that we were on the aggressive, in a region that was practically unknown to our troops, whilst the Spaniards were perfectly familiar with every foot of ground over which we must make the advance. As trained sol-

diers, their officers had carefully studied the range at every point. With this valuable information in their favor, they were in a position to commence an effective fire at remote ranges, say at 2000 yards or more. We could not locate them as soon as they located us, and when we did locate them, we had to study the range before we could commence an effective fire. It was while we were locating them and studying the range and gradually advancing that they placed so many balls in our soldiers. When we did commence an effective fire, we had reached a point where the remaining velocity of our bullet on impact was sufficient to carry it through the body. There is another explanation which may be gathered from the difference in the energy of the two bullets at remote ranges. Our bullet being larger and heavier than the Mauser, has greater energy at 2000 yards and it will penetrate farther in the remote ranges than theirs. Again, ricochet shots from the thick underbrush and broken ground undoubtedly favored a certain percentage of lodgment. Many of the officers attributed the lodgment of projectiles to the defective ammunition used by the enemy. This point was so susceptible of proof that I instituted experiments to show the relative penetration of the Mauser and Krag-Jorgensen rifles. The tests were made in large blocks of well seasoned yellow pine fired into across the grain three feet from the muzzle. The penetration of the Krag-Jorgensen ammunition was 24 inches, whilst that of the Mauser exceeded ours by nearly 10 inches, a demonstration which at once set at rest the idea of lodgment from the defective ammunition of the enemy.

8. "The old leaden bullet more often leaves fragments of lead in the foyer of fracture."

This is so true that it needs no contradiction. The leaden bullet was so soft that it often separated into a number of fragments upon striking resistant bone, whilst the steel-jacketed bullet seldom encounters resistance enough in the human body to disintegrate it.

9. "As the projectiles of smaller caliber are less apt to lodge in, or to carry foreign substances into the wounds, we should expect to find fewer cases of suffering due to the remote effects of unextracted foreign bodies."

This is true of the smaller bullet, as shown in Cuba. There were but few instances where clothing or part of the equipment was carried into the wound.

10. "The frontage of the jacketed bullet being much less and the fact that it does not lodge as often as the larger leaden bullet, will contribute to increase the percentage of recoveries in gunshot wounds of the lungs."

This was especially true of the wounded in Cuba. As a rule, the wounds of the lungs were apparently so trivial that it was difficult to restrain the men to a recumbent posture.

11. "Owing to diminished frontage, the new bullet will cause less disfigurement in wounds of the face."

This is especially true of three officers who received painful wounds of the face. Two of them had never been accused of being possessed of good looks, and strange to say, since their mishap they are much better looking than they were before. On cosmetic grounds the new bullet has some recommendations.

12. "The projectiles of hard exterior are more humane than the old. Resections and amputations will not be so often required hereafter. Soldiers will be more often restored to the State, useful members of the community, instead of cripples and pensioners and in point of economy, the new projectile confers a great advantage."

This last conclusion is also in accordance with the experience in Cuba. There were but three primary amputations and not one of them was done for injury by the small bullet. They were all the result of shell injuries. From the foregoing I believe we should conclude that the work of the experimenters agrees with the conditions found in war, and that their work was not done in vain.

VII. STERILIZATION OF WATER FOR TROOPS IN THE FIELD, WITH DESCRIPTION OF APPARATUS.

By WALTER REED, M. D.,
MAJOR AND SURGEON, U. S. ARMY.

THE advantage of a pure water supply, from the standpoint of health and diminution in sick rate, is admitted by all. First, to secure an abundant supply of pure water, and secondly, to protect this supply against contamination is the object of modern sanitary efforts. When this has been accomplished, we believe that the battle against the spread of certain diseases will be, at least, half won. This applies to the health of cities, towns and villages, and not less to aggregations of soldiers in the field. But it must not be forgotten that in the case of the former, as well as the latter, neglect to carry out other measures of sanitation, such as the proper removal of excreta and accumulations of filth of various kinds, will lead to the propagation of such diseases as typhoid fever and probably Asiatic cholera and dysentery, notwithstanding the absolute purity of the water supply. Should, however, the latter become contaminated, and the opportunities of contamination are especially great in military camps, then we must expect a marked and rapid spread of the diseases above mentioned. Hence the preservation of the water supply against even the suspicion of contamination must remain one of the chief duties of the military surgeon.

It is not necessary to remind the members of this Association, fresh from the camps of the late Spanish war, that uncertainty as to the wholesomeness of a water supply not only adds to the burden of the military surgeon's anxiety, but greatly hampers his efforts to carry out proper camp sanitation. They will doubtless recall the unanimity of opinion with which the water supply of certain large camps, such as Camp Alger, Va., and Camp George H. Thomas, Ga., was condemned as the source of typhoid fever in those camps, and hence the lack of well concerted effort to abate other sources of infection present in each regimental camp. They will also recall the earnest but well nigh

futile effort of the Medical Department of the Army to supply proper filters, such as, at first, the Maignan Water Strainer and the Berkefeld Filter. How quickly the former became clogged and the latter disarranged and ineffective, is fresh in the memories of many military surgeons. The adoption of the improved Pasteur-Chamberland Filter, with pressure gauge and charcoal strainer, although in the line of improvement, did not by any means fulfill the requirements of the situation. Too much intelligent attention was required in the matter of cleaning and sterilizing the tubes, neglect of either of which would lead to cessation of filtration or liability to the passage of pathogenic bacteria. Perhaps the writer, having been instrumental, to some extent, in the issue of these various filters to the troops, remembers more vividly the several disadvantages encountered and what seemed to be the almost hopeless task of securing an apparatus which, while effective, was not liable to disarrangement and which could be relied upon to furnish a sufficient quantity of sterilized water whenever called into use.

Although no satisfactory filter had been obtained at the close of the war, Surgeon General Sternberg did not abandon his efforts in this line. The writer, in addition to his other duties, was assigned to the task of securing a satisfactory apparatus for supplying sterile water to troops in the field, and later, with the same object in view, he was given the valuable assistance of such well known Sanitarians as Major Victor C. Vaughan, Division Surgeon, U. S. V., and Major Edward O. Shakespeare, Brigade Surgeon, U. S. V. This Board of medical officers, in addition to its investigation into the origin and prevalence of typhoid fever in military camps, was directed further by S. O. No. 306, Par. 43, A. G. O., Washington, December 29, 1898, to ascertain the best method for furnishing sterilized water to troops in the field, and to report the results of its investigation to the Surgeon General of the Army.

The writer is permitted, through the courtesy of Surgeon General Sternberg, to submit briefly to this Association the result accomplished by the Board.

It will be appreciated that in order to secure an abundant supply of sterilized water, an apparatus should fulfill the following standard of requirements :

First. It should exclude all living micro-organisms.

Second. It should not deprive the water of its natural gases.

Third. The sterilized water should approximate closely in temperature, the water entering the apparatus.

Fourth. It should not become easily obstructed.

Fifth. It should be durable and difficult of breakage in any of its several parts.

Sixth. It should be easy of transportation.

Seventh. It should remove all coarser particles held in suspension in the water.

Eighth. It should furnish not less than 300 gallons of sterilized water in the space of 12 hours.

It will be seen that if these requirements are fulfilled, the result will be an abundant supply of sterile water, clear to the eye, and palatable to the taste.

Among the various apparatuses submitted, the Waterhouse-Forbes Water Sterilizer was found to most nearly meet all the above conditions, and was recommended by the Board as being, in its opinion, superior to all filters or other water sterilizers submitted for trial, and well adapted for the abundant supply of sterile water to troops serving in the field.

The principle, action and construction of this water sterilizer is described as follows by the inventors:

First. A source of water supply having a maintained level below that required for causing the water to pass entirely through the apparatus.

Second. The application of heat to a part of the water in the apparatus at the point reached by the gravity (due to the maintained level in the source of supply) until ebullition is produced, thereby causing the water to rise and pass through the remainder of the apparatus, and

Third. The transference of the heat from the hot water passing from, to the cold water passing to, the point where the heat is applied.

In order to easily illustrate the action of the principle, reference will be made to the purely diagrammatic drawing, Fig. 1, in which (1) shows a water tank with a pipe (2) through which water enters and is allowed to fill the tank up to the water level (X) and no higher, as it is restrained by a float-operated valve shown



Waterhouse—Forbes' Sterilizer.

Two exchanges.

in the tank. The water to be treated passes from the tank (1) down through the pipes (3) into the compartment (4) of the heat exchange. Rising in the compartment (4), the water enters the heater (5) and rises in the pipe (6) to the level (X). Heat is applied to the heater (5) by means of the flame (7), which causes the water in (5) to boil over through the pipe (6) into the top of the compartment (8) of the heat exchange. When compartment (8) has become filled, the water runs off through the orifice (11) of pipe (10). While passing down through the compartment (8) the heat of the water, which is boiling hot, is transferred, by conduction, through the partition or diaphragm (9) to the cold water passing up through the compartment (4). So that the water, which is boiling in (5) passes out of the apparatus nearly as cold as that entering the apparatus; while the cold water entering the apparatus, becomes heated as it passes towards the heater (5) and reaches the heater in a very hot condition and nearly at the boiling point. Therefore, the only heat which can be applied is that necessary to bring the already heated water entering (5) to the boiling point, and cause it to rise above the normal level (X) and boil over through the pipe (6) and so pass on through the remainder of the apparatus to the discharge outlet (11). It will be observed, therefore, that but little fuel is required to operate this apparatus for the reason that the heat is conserved and used over and over again; whereas, by the ordinary process of boiling water and allowing it to cool off naturally, all the heat required for raising the temperature of the water so the boiling point is thrown away. For example, if water is discharged from this apparatus 5° higher in temperature than it had on entering the apparatus, but 5 units of heat are lost for every pound of water treated; whereas, by the ordinary method, assuming that water to have an original temperature of 62° F., it must be raised to 212° F. to reach the boiling point, and each pound of water treated, therefore, must have 150 units of heat put into it, and all this is lost in cooling. It is apparent, therefore, that this system is 30 times more economical in fuel. Fig. 2 represents a side view of this apparatus designed for the U. S. Government, and the view may be said to show the "raw-water side." (1) is the float-box or water tank containing a float-actuated valve which maintains the level of the water at the line (X); (2) is the pipe through which the water is

supplied to the float-actuated valve; (3) is the pipe through which water passes from the float-box to the bottom of the "raw-water compartment"; (4) is the first heat exchange. Rising from this compartment, (4) the water overflows and runs down through the pipes (5) to the bottom of the "raw-water compartment" (6) of the second heat exchange, and rising through compartment (6), the water flows through the pipe (7) into the heater (8), where it stops by gravity at the level (X). Heat is applied to the water in the heater (8) by means of an oil stove (9) whose flame is within the wind-gauge (10). When ebullition takes place, the water in (8) rises and flows over into the basin (11) and from this it runs off through the pipe (12) (Fig. 3 showing "sterilized water side of compartment") into the top of the "sterilized water compartment" (13). When compartment (13) and pipe (14) are filled, the water runs from pipe (14) into the top of the compartment (15), and when compartment (15) is filled, the water is discharged through the opening (17) of pipe (16); (18), (18), (18), (18) are vents to prevent air or vapor trapping the flow of water. Should, for any reason, the water level in the float-box rise above the normal line (X) the surplus of water will overflow through the pipes constituting the frame and run off at (19). When the apparatus is in operation, boiling hot water may also be obtained by stopping up the orifice (17) of the discharge pipe until the catch-basin (11) overflows at the small spout (20). For the sake of making the drawing clearer, the frame of the apparatus has been rendered in solid black in Figs. 2 and 3. Fig. 4 shows the frame itself set up. In this figure the side stays are shown, while in Figs. 2 and 3 they are not shown.

CONSTRUCTION. The apparatus is entirely self-contained, and may be easily and quickly assembled for operation or taken apart for transportation. In the latter case, the complete apparatus forms five bundles, no one of which weighs more than 45 pounds. The entire apparatus is thoroughly galvanized after its construction, thereby insuring a perfect zinc surface throughout, and preventing galvanic action from the water coming in contact with different metals. The frame which carries the entire apparatus, is of standard one-half inch wrought iron pipe connected with malleable iron fittings. The various pipes constituting the frame are easily screwed into the connecting sockets and

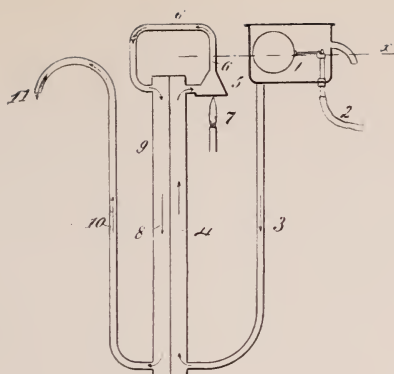


Fig. 1.

Vertical Section of Sterilizer - One exchange

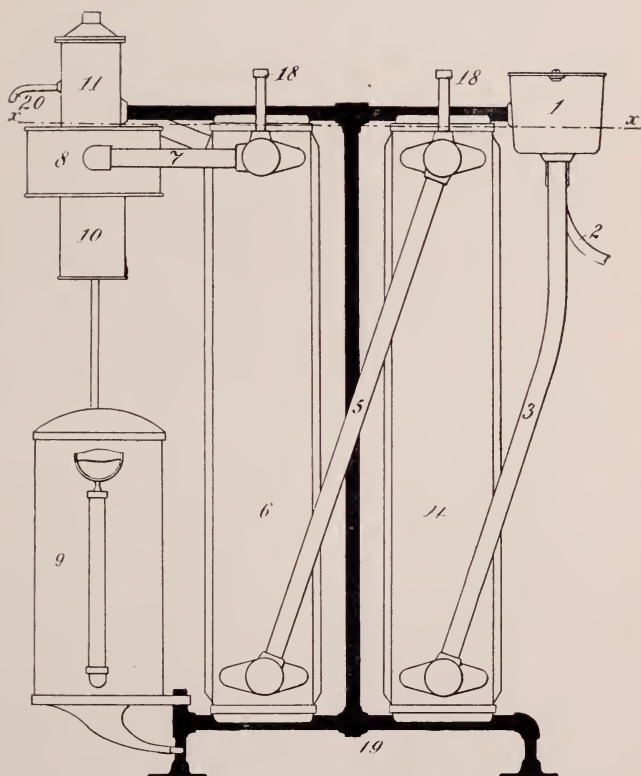


Fig. 2.

*U.S. Army Pattern of Sterilizer - Two exchanges
Rear and/or side*



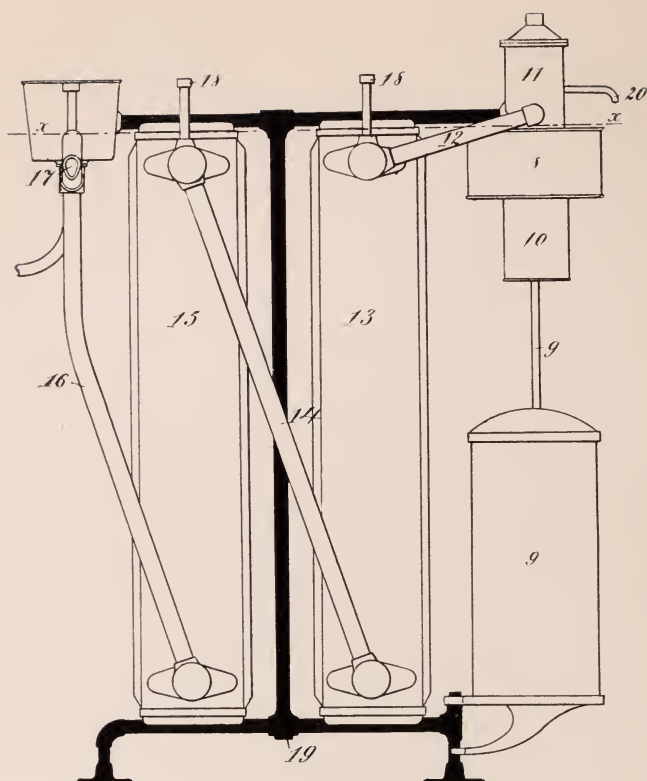


Fig. 3

*U.S. Army Pattern of Sterilizer - Two exchanges
Sterile-water side*

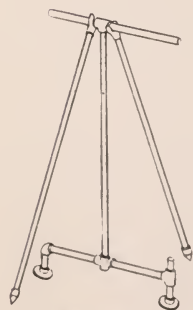


Fig. 4
Support

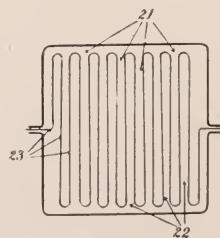


Fig. 5
Cross Section of Diaphragm.

fittings and, when taken apart for transportation, form a bundle of straight pipes, none of which is over four feet in length. The float-box is of cast iron and the float is of well-seasoned white pine especially treated to prevent water logging. The float-box is provided with a cover which is removable by unscrewing two bolts.

The circulating pipes, through which the water passes in its course through the apparatus, are of standard three-fourths inch wrought iron pipes, with special cast iron fittings. The most important member of the apparatus is the heat exchange, which in this case is divided into two units in order to lessen the weight of any single piece for transportation. Each heat exchange is in the form of a box $5\frac{1}{2}$ inches square and 36 inches long. The box is divided into two water-tight compartments (21) and (22), Fig. 5, by means of a diaphragm (23) or sheet of thin metal. The two half shells forming the box are flanged and riveted on opposite sides, and the diaphragm is held between these flanges on either side. Therefore, any leaking must occur from the interior of either compartment outward, and it is impossible for a leak to occur from one compartment to the other. The diaphragm is formed of a single sheet of No. 28 gauge iron, 3 feet wide by 8 feet long, folded back and forth into deep corrugations about $\frac{1}{4}$ of an inch apart and $4\frac{1}{2}$ inches deep (see Fig. 5.) The half-shells forming the box are of No. 20 gauge iron and the whole exchange, both shell and diaphragm, is flanged from the black iron and riveted together before galvanizing. In the process of galvanizing, the entire surface of the metal is not only thoroughly coated with zinc, but at the same time all the joints are entirely closed with zinc and the whole made absolutely water-tight. The heads or ends of the exchange are cast into the exchange of solid metal for a depth of $\frac{1}{2}$ inch, thereby not only preventing external leaking, but also preventing any leak from one compartment to the other. The ends are further covered with a casting which serves to hold the exchange in its proper place in the frame of the apparatus. The heater is in the form of a flat cone, having a rolled steel bottom upon which the frame impinges. From the top of the cone rises a small short pipe. It is within this pipe that the water rises by gravity and stops several inches below the top orifice of the pipe. The top orifice of this "fountain-pipe" is

several inches above the bottom of the catch-basin (11) so that any water that boils up through the "fountain-pipe" overflows and is caught in the basin (11), and cannot run back into the heater, but must flow out through the pipe (12). The heater is heavily insulated with a suitable material to prevent the loss of heat by radiation.

The fuel used may be either gas or kerosene. For troops in the field, the latter will be available. A large reservoir, capable of holding three gallons, is provided with a pump, by means of which the kerosene, under pressure, is fed to what is known as a Primus Burner and, reaching the latter as a gas, burns with an intensely hot blue flame. Thus no soot or deposit is left on the heating surface of the water-heater.

The capacity of this sterilizer (8) with two exchanges, as shown in Figs. 2 and 3, is about 26 gallons per hour, or at the rate of 312 gallons in 12 hours, with a difference in temperature of $4\frac{1}{2}^{\circ}$ F. between the non-sterilized and the sterilized water.

As the result of exhaustive experiments, the minute details of which it is not necessary to enter into at this time, it has been conclusively shown that water heavily charged with such test bacteria as bacillus prodigiosus, the colon bacillus, or the typhoid bacillus, escapes from the apparatus entirely rid of these micro-organisms. The only bacteria which have been found to pass through this sterilizer are such spore-bearing and resistant bacteria as the hay and potato bacillus and bacillus ramosus, micro-organisms which would prove quite innocuous as far as health is concerned.

A further careful test has shown that there is no loss of the natural gases during the passage of the water through this sterilizer, and that it is free from lead and other substances which might have entered into solution from the alloy used for holding the diaphragm in place.

The weight of the latest model of the apparatus is 150 pounds, and, since it can be taken apart and made into either four or five bundles, no one of which will exceed $43\frac{1}{2}$ pounds in weight, it will be seen that this sterilizer is quite transportable.

The advantages of this most ingenious sterilizer may be summarized as follows:

First. That water passing through it, although brought to the boiling point, is maintained at this temperature for so short a

time as not to be deprived of its natural gases, and hence not rendered unacceptable to the taste.

Second. That all living micro-organisms, except a few spore-bearing bacteria, are destroyed by the degree of heat attained during the passage of the water through the apparatus.

The disadvantage of the escape of a few spore-forming bacteria through this apparatus, is considered to be of no practical importance.

Third. It furnishes an abundant supply of practically sterile water, and may be kept in action, if necessary, for the entire 24 hours without renewing the supply of oil in the reservoir, and at a cost of about four cents an hour.

Fourth. The water, having been slowly heated until it reaches temporarily the boiling point, is afterwards cooled to within $41\frac{1}{2}^{\circ}$ F. of the water entering the apparatus. This is one of the important advantages possessed by this sterilizer. By placing the bottom of the exchange in a freezing mixture, the temperature of the sterilized water, as it flows from the machine, may be reduced below 40° F.

Fifth. Its durability and freedom from liability to breakage.

Sixth. The facility with which the apparatus may be put together and entirely taken apart; only one tool, a wrench, being required for this purpose.

Seventh. The facility with which the apparatus can be thoroughly cleaned. This is effected by the removal of the side pipes, thus permitting a complete flushing out of both exchanges.

This sterilizer, therefore, fulfills all of the requirements which could be demanded of any apparatus, except that it does not remove from the water the coarser particles held in suspension. The latter, however, may be effected prior to the passage of the water through the sterilizer by means of some simple filtering contrivance easily and quickly set up in any camp, such as one or two water barrels partially filled with fine and coarse sand, and placed at a proper height above the apparatus.

Those who have given attention to the sterilization of water fully appreciate that the one thing required is the destruction of pathogenic micro-organisms, and the removal of cloudiness is quite a secondary matter. In the case of any sterilizing apparatus involving filtration, the very attainment of this clarification of the water, by the removal of suspended material, including bacteria,

promptly leads to the clogging of the filtering cylinders, and hence an equally prompt cessation of filtration.

The Waterhouse-Forbes sterilizer, however, is in no sense a filter. It does, however, destroy all pathogenic micro-organisms, and hence meets the most important requirement of a sterilizing apparatus.

In submitting this water sterilizer to the Association of Military Surgeons, the writer believes that we have here an apparatus capable of solving that most important problem of camp sanitation; viz., the supply of pure and palatable water, and he takes great pride in announcing that this apparatus is the product of American inventive genius.

VIII. ECHINOCOCCUS-HOMINIS—A REMARKABLE
CASE OF ECHINOCOCCUS, MANIFESTED FIRST
IN THE CHEST WALL AND SUBSE-
QUENTLY IN OSSEOUS TISSUE
OF LEFT HUMERUS.¹

BY CAPTAIN GEORGE WORTH WOODS,
MEDICAL DIRECTOR, U. S. NAVY.

PHILIP DOUGHERTY, oiler, was admitted to the Hospital January 20, 1899, with a diagnosis of "contusio," which had been received while engaged in a drunken row ashore. There was a fracture of the left scapula, horizontal in direction, extending from the base of the spine of the scapula to its axillary border. He at this time complained of pain in the abdomen, as well as in various other parts of his body. There was a slight cough present, with a moderate amount of muco-purulent discharge. The pain in the abdomen, the cough and expectoration continued to grow worse, the expectorate more profuse until the 8th of February, when a diagnosis of pleural effusion, probably purulent in its nature, was made.

Was operated on February 11, with all antiseptic precautions, first local and then general anesthesia being used; the incision was in the line of the sixth rib, of which about one inch was removed, the pleura incised and the finger introduced into the cavity. There was a large bulging mass in the lower part of the pleural cavity, which apparently came from the diaphragm; this was first punctured with a hypodermic needle to make sure that the pus was inside of it, and then it was incised and about one quart of pus removed. The wound was drained with two large rubber tubes and dressings applied.

On February 20 the edge of this membrane was caught up with forceps and fingers and pulled out through the opening in the chest wall. The sizes of two of the pieces taken out were $12 \times 12 \times \frac{1}{8}$ inches; and several smaller pieces about 4×6 inches. All of these membranes curled up at the edges. Four days later, while washing out the cavity, a large number of cysts, varying in size from that of a grape to a diameter of two inches, were expelled and a huge one of a capacity of four quarts, all fully distended, and as a sound could be passed through opening to lower border of ribs, the diagnosis of hydatids of liver, which had forced their way through fibres of the diaphragm, was made. This was confirmed by a microscopical examination showing the typical form

¹ From Records of U. S. Naval Hospital, Brooklyn, N. Y.

of echinococcus, cell wall scolices, with double rows of hooklets, and free hooklets.

The case progressed satisfactorily, though slowly, until March 22, when there was developed a severe pain in the left shoulder, with swelling and limitation of movement of the arm, elevation of temperature and other signs of bone involvement.

On April 9, the wound in side not having closed, and the depth remaining the same, an operation was performed to open the sinus at its lower and expanded end. An incision was made in a curved direction over the ninth and tenth ribs on that side, and about two inches of the ninth removed, the incision being carried on, and the peritoneal cavity opened at its anterior extremity; the liver was now sutured to the abdominal walls and three days later the incision carried through the liver substance to the lower end of sinus. The drainage tubes were removed from the upper wound and a large tube introduced into the lower one, and antiseptic dressings applied.

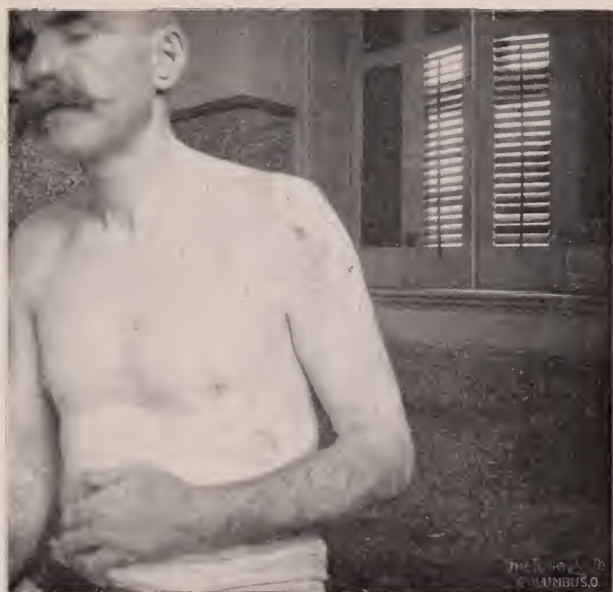
The wound healed satisfactorily and was well May 19.

The pain, enlargement of shoulder, and the other symptoms of bone disease continuing, an operation was made on the greater tuberosity of the left humerus May 29. The incision was about two inches long and down to the bone, which was found softened and easily removed with curette. After scraping away about one-fourth inch of bone, the curette entered a cavity in the head of the bone, which was about one inch in diameter and about two inches long. As soon as the cavity was entered, there was an escape of bloody fluid; no pus could be detected. The bone was softened and was easily removed, the cavity appeared to be lined with a membrane, undoubtedly the fixed cystic wall of an echinococcus. This cavity was carefully curetted and packed with iodoform gauze, and dressings applied.

The case now improved slowly until healing was complete, August 6. After the operation on the pleural cavity, it was washed out first with hot saline solution and then with compound tincture of iodine solution, 1 in 30, and later 1 in 15. No other treatment.

The most complete account of this form of parasite is found in the work of T. Spencer Cobbold, Lecturer on Comparative Anatomy, Middlesex Hospital, London, England.

In this classical work the following statistical table appears, with parts of the body involved by the parasite, and the final results summarized:



STATISTICS.

I. Organs affected—

1. Liver.
2. Subperitoneal areolar tissue.
3. Omentum.
4. Muscle of the heart.
5. Brain.
6. Spleen (generally associated with one of the liver.)
7. Kidneys.
8. Lungs.
9. Bones. (Rokitansky.)

II. Analysis of 373 cases—

1. Liver	165
2. Lungs	40
3. Kidneys	30
4. Pelvis	20
5. Brain	20
6. Bones	17
7. Trunk walls	12
8. Heart	10
9. Orbit	9
10. Breast	7
11. Soft parts of thigh.....	6
12. Neck	5
13. Ovary	4
14. Spinal cord	3
15. Globe of eye.....	3
16. Pulmonary vessels	2
17. Pituitary body	2
18. Face	2
19. Mouth	2
20. Soft parts of shoulder.....	2
21. Scrotum and testis.....	2
22. Supra-renals	1
23. Vesiculæ seminales	1
24. Walls of the uterus.....	1
25. Placenta	1
Total	373

III. Analysis of 165 liver cases—

1. Projected into thorax.....	4
2. Opened into pleura	9
3. Communicated with base of lung	21
4. Opened into biliary passages.....	8
5. Opened into peritoneum.....	8
6. Opened into bowels.....	22
7. Remaining cases of ordinary character.....	
(Davaine.)	

IV. Analysis of 136 cases—

1. Liver	51
2. Abdomen	19
3. Brain	16
4. Heart	8
5. Lungs	8
6. Kidneys	4
7. Bladder	3
8. Pelvic cavity	3
9. Tibia	7

Scapula, frontal bone, anterior condyloid foramen, orbit, spinal cord, neck, breast, arm, loin, thigh, under biceps femoris, humeri and temporal muscles, ovary, blood, pericardium, diaphragm and fetus—one each.

(Cobbold.)

Liver cases—

Recovered	35
Spontaneously	4
Temporarily by natural means	2

Of which only two were correctly diagnosed prior to operation.

Abdominal cases—

Recovered	7
Died	12

Brain cases—

Recovered	00
Died	12

Heart cases—

Recovered	00
Died	8

Lung cases—

Recovered	1
Died	7

Spleen cases—

Recovered	00
Died	2

Diaphragmatic cases—

Recovered	00
Died	1

Kidney cases—

Recovered (doubtful)	1
Died	3

Such is the classification of Cobbold in his classical work on entozoa.

This case, medically and surgically, was under the charge entirely of Past Assistant Surgeon Reginald K. Smith, U. S. N., to whom is due the credit of the very successful conclusion.

IX. HOSPITAL EXPERIENCE IN THE WAR WITH SPAIN.

BY LIEUT. COL. JEFFERSON D. GRIFFITH,

MEDICAL DIRECTOR, N. G., MO.

AT the beginning of the Spanish-American war, most of us were ignorant of some of the practical features of warfare. As surgeons, we thought we could amputate a limb, we were familiar with laparotomies, and had an idea that we were fully competent to deal with the necessities of the occasion. Many of us even thought we knew something of the proper sanitation of camps, and disinfection. After a few weeks in Chickamauga, we found that our ignorance was sublime. We began to learn something of the army "red tape," and that, apparently, a medical man's knowledge of medicine was of very small moment, compared with his knowledge of bookkeeping.

I arrived at Chickamauga Park the early part of June, and at once assumed my duties as Chief Surgeon of the Third Division of the First Army Corps. I found the troops all encamped in the woods, open spaces being scarce, and reserved for drilling and parades in accordance with the directions of the Commanding Officers at the park. We were encamped in a locality lying between the Brotherton and Alexander roads, and in close proximity to Chickamauga Creek. The soil in the vicinity was largely composed of layers of a variety of clay, quite impervious to moisture. In many places, below this clay, was rock, preventing the digging of sinks to a proper depth, and in places where it was impossible to dig them sufficiently deep, there was no absorption, owing to the nature of the soil. There is no doubt that the geological formation of this locality made its selection as a camping ground exceedingly unfortunate.

Throughout the park were numerous sink-holes, through which the surface water would pour in out of sight, to form so-called springs at other places. For this reason the water from the driven wells, five of which were located in this Division, would be so muddy and dirty after a rain that not even animals would drink it.

The water for drinking purposes was deficient, both in quantity and quality, was almost hard, and aggravated enteric troubles. The water at first used was from wells in Chickamauga Park, but later it was hauled a distance of five miles from Blue Springs, and the Park Springs. The latter was a hard mineral water, and both of these springs must have become contaminated later. Water from Chickamauga Creek was piped through the park, and of the infection of this water there is no doubt.

The first two cases of typhoid fever in our Division appeared in the Fifth and Ninth Pennsylvania regiments, one of which cases came from Camp Gretna, and it is very easy to see how the bacilli could be rapidly disseminated throughout the troops by the innumerable flies that infest this country, particularly in view of the fact that the men were somewhat lowered in their powers of resistance on account of the irritation from the hard water which they were drinking.

On June 15th. typhoid fever had made its appearance, and I asked that all the water used for drinking be boiled, and at this time requisitions for boilers and barrels were made by General Wiley, then in command of the Division. I also had a well closed that was situated between the First South Carolina and the Ninth Pennsylvania regiments, as I had no doubt as to the surface seepage and infection. The reports on the 29th. of June showed that the drinking water was not being boiled, as per orders, and on the 30th. I reported that there were twenty-three cases of typhoid fever in the Division Hospital and that regiments were not supplied with boiled water on account of the lack of boilers and barrels. The water was a constant source of infection, but we were unable to remedy it. My recommendations and urgent entreaties that the men use only sterilized water were fully appreciated by the Division Commander, but neither boilers, barrels nor disinfectants were obtainable. Our quartermasters made repeated efforts to obtain this material, but their efforts were fruitless. Perhaps, even had we been able to obtain boilers and barrels, the soldiers would not have drunk boiled water, owing to the failure of the Government to provide ice to make the water palatable.

The increase of typhoid fever from this time became gradual and steady. On July 10th., there were 57; on July 20th., 163; on

July 30th., 276; on August 11th., 353; on August 14th., 587 cases. It must be remembered that during this entire time the work of the Hospital was being carried on by an absolutely inexperienced Hospital Corps, which at no time numbered over fifty. Many of these men had no special qualifications for the work, and were practically of no use. The commanding officers of the different regiments were asked to furnish men for the Hospital Corps. Instead of supplying men from their commands who would have been of service in the nursing of the sick, many regimental commanders saw in this a good opportunity of getting rid of men who were of no value in their companies, from lack of intelligence or from sickness. Many of the men were deficient mentally and physically in the qualities that would have made them suitable for this work. This was not surprising, as the regimental commanders throughout the Division were impressed with their ability to care for their sick in their individual regimental hospitals.

The Corps, however, contained some very suitable men who had had previous experience in nursing, or were medical students. These men worked nobly in the fever wards, and are entitled to much praise. Probably half of the number of trained nurses would have been much more efficient than the men we had, and I earnestly recommended that the services of the trained nurses offered by the Red Cross Society and other organizations be accepted. I thought it practicable to employ female nurses in the Division Hospital when it was located, and still think it would have been an important factor in the nursing of our typhoid patients. The surgeons at the hospitals were badly overworked. On July 7th. I reported 98 patients in the hospital, and only seven surgeons, including the Surgeon in Charge, and a medical officer who was acting as Quartermaster. This number was, of course, utterly inadequate. These officers were taken from the regiments, and the regimental "dispensary" was left with one surgeon, one steward and one orderly. Possibly this might have been sufficient had the Division Hospital been furnished with the necessary number of nurses, tentage, etc., and had there been some means of relieving the congested state of the hospital by a systematic transfer of patients to general hospitals. As it was, the Division Hospital could not accommodate all the

sick of the division, and, as a consequence, many had to be treated in the so-called regimental dispensaries. One surgeon, one steward and one attendant in each regiment could not do all the work required in a satisfactory manner. No provision having been made for regimental hospitals, most of the necessary canvas, cots, etc., were purchased with private funds. In my opinion, regiments should have retained their medical officers and hospital stewards provided them by law, and the Division Hospital should have been supplied with medical officers from an entirely different source. I think it was a mistake to take these medical officers from their regiments under these circumstances.

On August 11th. the fever had increased to an alarming extent, and feeling confident that the ground where the troops were located was saturated with ammoniated nitrogenized elements and the germs of disease, I recommended the removal of the Division from the ground where it was then encamped. This was done, and the construction of sinks and latrines was much better than any previous time in the history of the Division. Now, for the first time, the supply of boilers, barrels and filters was sufficient to render the orders of the commanding officer effective. Drills were discontinued so as to enable the men in every way to attend to recuperation and personal cleanliness. The troops were then in such an exhausted and debilitated condition that it was necessary to do what we had already advised, and on August 21st. the Division began to move to a camp established at Lexington, Ky.

The camp at Lexington was one that would have been difficult to improve. Great care was used in the selection of a site for a Division Hospital. A spot was chosen on elevated ground, which was well drained, far removed from the grounds intended for regimental camps, and yet easily accessible. I had anticipated much sickness, knowing that many of the soldiers were already infected with disease, and in preparation for the reception of patients, I had ordered by telegraph and otherwise (the Surgeon-General having given me the greatest latitude), all necessary tentage, lumber, medicine, etc., so that after our arrival at Lexington there was no time when the hospital was not able to take care of any patients sent to it, and we had sufficient tentage, etc., to expand the hospital to meet any emergency. The Surgeon-

General authorized the employment of three matrons and as many trained nurses as we needed (158). In addition to the medical officers, 43 contract surgeons were employed; 712 beds were in use.

The water in this vicinity was carefully examined by Nessler's test, which gave negative results, showing the absence of ammoniated albuminous compounds. The water was very good, and the supply ample.

The amount of sickness was very large, many having been infected with typhoid fever, and all being greatly debilitated by their encampment at Chickamauga. Most of the cases of typhoid fever were taken ill in less than three weeks after their arrival; all of those reported among the troops from Camp Thomas, however, were in the possible period of incubation, considering the infection to have occurred in Chickamauga Park.

We succeeded, by the strictest sanitary measures, in thoroughly getting rid of typhoid fever, and when the troops moved to the Southern points from which they were eventually transferred to Cuba, they were in excellent condition. When we consider the great amount of typhoid brought to Lexington from Camp Thomas, its entire elimination in so short a time was somewhat remarkable, and shows what strict sanitary measures can accomplish.

My rules of disinfection, to be carried out under the personal supervision of the Regimental Surgeons, were as follows:

I. Solution chloride of lime (one bottle to a bucket of water) to be used in each sink three times a day.

II. Solution of sulphate of iron (ten pounds to ten gallons of water) to be used in each sink, also three pounds of powdered copperas to be sprinkled in each sink once a day.

III. One-half gallon of crude petroleum to be thrown into each sink once a day.

IV. The floor seats and walls of each sink to be mopped out with a solution of bichloride of mercury (corrosive sublimate, ten ounces to a gallon of water), once a day.

V. Each tent floor to be mopped off thoroughly with solution of bichloride of mercury once a day.

This method of disinfection was carried out rigidly, under the direction of the regimental surgeons, and with frequent in-

spections by myself. The use of the crude petroleum advocated by Gen. Jno. A. Wiley, N. G., Pa., was very efficacious, as it kept the sinks free from the common house fly, probably the greatest cause of the spread of infection. In addition to this disinfection, rigid policing of camps, tents and persons was instituted. The tents of all enlisted men were floored, and separated by the width of one tent. Strict supervision of food and cookery was ordered, and hucksters' stores were carefully inspected by the Officer of the Day, or the guard, to see that fruit and vegetables were fresh, and that milk and butter were sweet and palatable. No efforts were spared to see that the men were protected from deleterious articles of food. The sale of pies, cakes, etc., within the regimental camps was forbidden. Latrines were dug deep and well housed, with covered seats, and at least 50 yards from the kitchen sinks. The kitchen sinks were dug ten yards from the company kitchens.

Some of the lessons taught by the camps at Chickamauga, Alger and elsewhere, are:

I. That we, as a nation, should not be lulled to a sense of fancied security by thirty-five years of peace, and that the best way to prevent war is to be prepared for it.

II. That we should have not only ample medical supplies, but less "red tape" in obtaining them. As the Inspector General of the Third Division, Army Corps, says, in his official report, with reference to the medical department at Chickamauga, "the administration of this department was a dismal failure." It is humiliating for a great nation to be obliged to depend on aid societies and charitable persons for ice and necessary medical supplies.

III. Our Medical Department should be divorced from the Quartermaster's Department. As a matter of fact, the Quartermaster's Department was largely at fault for much of the trouble, and while satisfactory for the conduct of a small army in time of peace; when built upon and expanded as required for an army ten times as large, it failed absolutely and went to pieces. During the hot summer months seventy-five per cent. of the command still wore the heavy woolen clothing. Insufficient tentage was issued, resulting in overcrowding the tents. This was a cause of much of the subsequent sickness.

IV. More surgeons should be left with a regiment, and Division and General Hospitals should be supplied independently with surgeons.

V. Permanent army camps should be maintained where armies can be quickly mobilized, where there can be covered sinks and facilities for boiling water. In these camps, the National Guards of the different states could be assembled yearly, and taught to inure themselves to the necessary hardships of camp life. Let me say that Chickamauga could have been made, with a very little expenditure on the part of the Government, through an able Commander, most healthful by the establishment of garbage crematories for each regiment, facilities for boiling water, and by placing troops in the open.

X. REMINISCENCES OF THE EXPEDITION TO THE PHILIPPINE ISLANDS.

BY LIEUT. COL. HENRY LIPPINCOTT, U. S. ARMY,

LATE CHIEF SURGEON DEPARTMENT OF THE PACIFIC AND EIGHTH ARMY CORPS.

TO the medical officers who took part in the military expedition to the Philippine Islands the following will be ancient history, but possibly may not be uninteresting to others. Of course, it is not necessary to recall here the destruction of the Spanish fleet in Manila Bay, and yet it is difficult to avoid reference to the half sunken monuments, not to the glory of Spain, which met our eyes as we steamed to anchorage there. The important sequences in that water and on the land from the arrival of General Merritt will be referred to and described as carefully as time and space will permit.

On July 25th., 1898, the Transport Newport, carrying the Commanding General, with his personnel and department staff dropped anchor off Cavite. On that ship, besides those noted, there were five hundred and forty-eight enlisted artillery men, with their officers, also fifteen civilians attached to headquarters. The Newport's arrival in the bay was the signal for early offensive operations, and despite the difficulty of landing troops and stores from this ship and others of our fleet, preparations for the attack on Manila went rapidly on. By July 31st., all the vessels comprising the first, second and third fleets had arrived in the bay, each conveying troops and supplies. The first fleet, General Anderson commanding, carrying one hundred and fifteen officers and two thousand three hundred and eighty-five enlisted men, arrived at Manila June 30th., 1898. The second fleet, under the command of General Green, and carrying one hundred and fifty-eight officers and three thousand four hundred and four enlisted men, arrived July 17th. The third fleet, General McArthur commanding, carrying one hundred and ninety-eight officers and four thousand six hundred and forty-two enlisted men and nineteen civilians, arrived July 31st. Grand total (including officers and men on the Newport), ten thousand four hundred and thirty-one

enlisted men, four hundred and seventy-one commissioned officers and thirty-four civilians.

Only those who have been there can estimate the trials and hardships incident to disembarking soldiers and unloading vessels when the bay is rough and the winds high. Manila Bay is practically an open sea, and in the rainy season all service is attended with great risk. This was especially so just prior to the attack on the Spanish works, for the reason that all landings had to be made through the surf and with most indifferent devices in the way of boats. All this was expected, but American ingenuity and perseverance were equal to the occasion, and men and material were landed in the face of seemingly insuperable obstacles.

At this stage of affairs the Medical Department of the expedition was put to its utmost effort in order that there should be no mishap. Very soon after the Commanding General arrived in San Francisco, and while we were preparing for the voyage to the Philippine Islands, he, in effect, informed me that I would control my own department. This gave me great power, but it also brought great responsibility. Surgeon-General Sternberg had given me everything I asked for, so that we had in the ships plenty of supplies of all kinds.

As stated above, a battle was impending. About nine thousand of our men were to attack about thirteen thousand Spaniards, the latter being behind a line of works extending from Fort San Antonio on the south, and embracing the new as well as the old city of Manila to the water front on the north. Naturally we expected that our wounded would be many. At this supreme moment the Medical Department must not be found wanting, and so with the untiring and valuable assistance of Surgeon George H. Penrose, we gathered from the transports tents, beds, bedding, medical and hospital stores, special foods, stimulants, field furniture, including camp stoves and a quantity of dressings, first aid packages and litters, all this under conditions that were appalling because of the scarcity of transportation, together with storms then prevailing. By midnight on August 11th., however, the Medical Department was ready and had every essential, including land transportation, to do its work creditably.

On the morning of August 13th., the American troops left Camp Dewey, near Tambo, and began the march to the front,

and the rain, seldom absent, came down heavily. After a while the storm ceased, and as the atmosphere cleared, we were able to see some of the troops getting into position. By this time the guns of the fleet opened on Fort San Antonio (known also as the Malate Fort) and on the Spanish trenches leading from the fort away along the different block houses, the now famous "Number 14" being nearest the water on the south. General Merritt, with the Department and Personal Staff and six companies of the 2d. Oregon Infantry, were on vessels which accompanied the war ships, and were ready to land in Manila the moment the city should surrender; and this happened in the course of the day. The next day, steps were taken to remove the sick and wounded from Camp Dewey.

The large establishment called by the Spaniards the Hospital Militar, but now known as the First Reserve, was inspected, cleaned, repaired and occupied by us. On August 17th., all patients were removed from Camp Dewey to this hospital, and our sick and wounded received every aid and comfort. This hospital was erected by the Spanish about twelve years ago, and was supposed by them to accommodate from eight hundred to a thousand patients. We never had that many at any time within its walls, but with the addition of well-appointed tent wards we had more. The wards are well constructed, and very large and roomy, but the location is bad owing to the swampy surroundings. The sewer and closet arrangements, like everything of the kind in Manila, were unsanitary, but we had a surgeon in charge (Crosby) who worked unceasingly until the establishment took on many of the good features of the hospitals in America. All the sick and wounded were brought to this large hospital, but we soon established the Second Reserve Hospital, first as a convalescent hospital and for the overflow from the First Reserve. Later, many serious cases were admitted to it, and it was well governed by Dr. Keefer, of the Army, now a surgeon of volunteers. I had great difficulty in getting this building, owing to the objections of the agents. The building, which was very large and well constructed, had been built at the expense of a French lady for a young woman's seminary. For some reason the school was not a success—the Filipino girls did not take kindly to it—and it was abandoned as a school about two years before our arrival in

Manila. The institution was known by the Spanish as the *Collegia de Agostius*, also as the *Convent de La Acencion*. It made a fine hospital, it is thoroughly equipped, and dates as such from September 23rd., 1898. At the time I selected this building every effort was made to prevent our taking it, but General Otis, always ready to assist me, gave the necessary orders and it was soon ready for its present use.

The Corregidor Hospital was opened by Dr. Owens on the 25th of November, 1898. It is situated on the island of the same name, about thirty miles from Manila. The temperature on the island is generally ten degrees below that of Manila. It is free from malaria and has plenty of shade trees. The salt water bathing is excellent and it is a model spot for a large hospital. Major Owens early began a very simple but excellent system for water supply, which is of good quality.

The hospital at Cavite was always regarded as a kind of Post Hospital; the buildings were not suitable, but were the best we could obtain at the time.

The Spanish established a kind of sanitarium near Los Bancos on the Laguna de Bay a number of years ago. The buildings were more or less wrecked by the insurgents, but because of the mineral springs (hot and cold) will no doubt be utilized later. It is said that the Spaniards sent many rheumatics as well as other chronic cases there, and that many new and excellent devices were provided.

The diseases incident to the tropics are met with in Luzon. Dysentery in its various forms is always present. Enteric fever, too, long ago became fastened to the coast line, and leprosy is deeply rooted. The inordinate activity of the skin greatly tends to dermatic affections, which are exceedingly common and often severe. Pemphigus in Luzon is of frequent occurrence and sometimes terribly serious—death not infrequently resulting from it. Slight injuries often result in long unhealed ulceration, and this is due to excessive perspiration with its attending debility. Smallpox is endemic among the Filipinos, and although often malignant and fatal, never caused them to avoid or take steps to prevent the disease. With them the smallpox is like measles with the Mexicans—mild cases wandering about the cities and towns when we entered Manila. Of course, all this was stopped

when our army took control, and the most energetic means adopted to prevent the spread of the disease. Vaccination and revaccination of our troops went on as systematically as the drills at a well regulated post. Our virus was obtained first from San Francisco, but very soon after the fall of Manila I had our purveyor send to Yokohama and to Saigon for tubes, and these came as often as required. Later, Major Bourns, of the Health Department, established an institute in Manila, where we obtained much of the virus used. The material from all of these sources was excellent and the results, both in the army and among the natives, were very satisfactory.

I believe I can say that no army was ever as carefully looked after in the matter of vaccination as ours, and that the Department Commander, General Otis, fully alive to the necessity, did everything in his power to make our work possible and effective.

Connected with the First Reserve Hospital, a well appointed laboratory was early established, with a thoroughly competent Medical Officer in charge, Assistant Surgeon McVay, U. S. Army. He unfortunately contracted typhoid fever while in the performance of his duties, and succumbed to that disease. The good work he inaugurated, however, was quickly taken up by another, and valuable lessons have already been learned in this department of medical investigation.

As a rule the wounded men did well, not only after the taking of Manila, but from the 4th of February, 1899, when the insurgents began their attacks on our lines. Of course, we had excellent surgeons on the firing lines, where first aid was given by the Medical Officers and Hospital Corps, under the Superintendence of Chief Surgeon Cardwell, of the Volunteers, and by the Ambulance Company, under Assistant Surgeon Keefer, of the Army. Indeed, many of the primary dressings proved to be sufficient and in numerous cases none other was required. These remarks in regard to first aid work refer to the campaign against the Spaniards; they apply also to the treatment of our wounded in the long list of engagements, beginning with the attack by the insurgents in the early part of February. The Chief Surgeons, Cardwell and Hoyt, saw that the wounded were well cared for before transportation, whether by ambulance, rail or by water, to the First Reserve, and the men arrived in as good condition as

could be expected. The seriously injured did remarkably well, and it is more than likely that the surgery of the American Army in the Philippine Islands will stand out handsomely when the record is made up. To be sure, we had in Wm. D. Crosby, of the Regular Army, and Reynaldo I. Fitzgerald, of the Volunteers, giants in surgical science and art, and they in turn had assistants, Assistant Surgeon Straub and others, who will long be remembered.

Now, a word about our medical storehouses. I believe I can truly say that we had better establishments of this kind, and that they were better supplied than those of any other army under any conditions. This is saying a good deal, but notwithstanding the distance from our base, San Francisco, we had every comfort and every essential the most exacting could demand. Moreover, Surgeon General Sternberg gave me authority to use the cable for requisitions, placed large amounts of money at my disposal and required me to see to it that the sick and wounded did not suffer for want of not only essentials, but luxuries. Our purveyor, Major Corbusier, of the army, ever on the alert, kept his storehouses full by regular and far-seeing requisitions, and thus we rarely needed to use the cable.

I would here add a line in regard to the Filipino prisoners. When wounded or sick, these people received the same treatment and attention as our own men. Many of them did well, notwithstanding their propensity to pull off dressings and finger their wounds. As a result of this handling, suppuration was common among them, while the reverse obtained with our men.

The water supply of Manila ought to be good for the reason that it is taken from a source that can be protected. The San Mateo River, a tributary of the Pasig, furnishes the supply, and when the natives can be taught to refrain from polluting the stream, the necessity for boiling all drinking water may cease. The water question was a most serious one when we entered the city, and this was due to the fact that Aguinaldo held the plant and did not permit the water to run in the mains until August 23rd. Before that date we were obliged (as the Spaniards had been for a long time), to use water caught from the roofs of the buildings, and this was neither sufficient nor wholesome, owing to the material used in the construction of roofs.

Manila has a medical school, a well equipped observatory, many quaint old churches and convents, and two or three fairly good hospitals, but its hotels and theaters are far behind the times. As to schools, I can say little, but that much was done in the way of education, there is abundant evidence.

Its sewer system is absolutely unsanitary, and the moats surrounding the walls of the old city menace the health of the people.

Manila has a redeeming feature in the Luneta, on which many drive in the cool of the day, and this is a delightful pastime when the bands are playing and the best people of the city throng the roadway.

That there is a wonderful prospect in store for the islands, there can be no doubt. The commercial aspect is highly favorable when we consider the timber, hemp, coffee, sugar and tobacco output only, but there are other vast and important possibilities, and with the good government that the United States will institute, the landing of our forces there will result in a great good to the Filipinos and to our own country.

In closing this paper, I desire to offer a tribute of gratitude to the Medical Officers of the brigades, regiments and hospitals, all of whom performed their various duties cheerfully and efficiently; and, finally, my grateful acknowledgments to my friend and office assistant, Major J. M. Cabell, U. S. Army.

XI. FLEXION OR BENT-KNEE MARCHING.

By E. H. BRADFORD, M. D.,

BOSTON.

AN investigation of the best manner of walking, as an exercise for correct carriage or on the march, will interest the physician and the gymnastic teacher, but none more than those in charge of the training of soldiers, for rapid marching was never so important to the strategist and tactician as it is today. The Confederate general, Forrest, defined the science of war as "getting there first with the most men." It is for this reason that the subject has attracted much attention among military men

Rapid movement is spoken of by an English writer¹ on the subject as of "prime importance in field-mancœuvres, and more so today than ever; the time is gone by when heavy troops composed the main body of an army; the lesson of all recent campaigns is that great celerity of movement is indispensable."

In the last German mancœuvres special attention was paid to rapid marching.

In the ordinary gait, as seen in pedestrians in our cities, the forward leg is advanced (the trunk being held erect) by the muscles of the front of the thigh and leg, viz., the psoas and the iliacus and the extensor cruris. After the foot is planted upon the ground firmly, another set of muscles by their contraction pulls the body forward. The heel, and later the front of the foot, but chiefly the heel, pressed upon the ground, are used for a pressure point to which the body is drawn. The muscles used for this are the glutei and the hamstrings. The rear leg at the same time is used as a means of propelling the body forward by pushing, while the front leg is still in the air. The muscles that are brought into play for this push are the psoas and iliacus muscles, the hamstring, and the calf muscles.

The weight of the trunk and head is at the moment of double support, equally divided between the points of contact of the two feet. When the individual habituated to this manner of walking

¹ *Contemporary Review*, March, 1899.

wishes to increase his gait he does so by increased muscular effort, using a longer and more rapid stride, and this is the gait of active pedestrians in cities and the one to which soldiers have been hitherto trained.

It is not, however, that used by those obliged to economize their muscular strength in locomotion, as couriers and hunters. It is not the active gait of savages, or of children, or of those accustomed to walk habitually over uneven ground.

In the common gait in the evened paths of cities and towns the body is held erect. If, however, the trunk were inclined forward, it would of its own weight fall forward and thus be propelled in a measure without muscular action. This mode of locomotion,—i. e., falling forward—is actually employed in China by penitents in a pilgrimage to a shrine, the body alternately falling forward at full length, rising to fall again (cycle of Cathay.) This same force—viz., the weight of the trunk falling forward—can be utilized practically.

So long as the trunk is inclined out of equilibrium, it will tend to fall forward. The action of the legs may be chiefly to keep the trunk from falling to the ground, but in fact they may also aid in driving the inclined trunk forward by pushing. The whole of the sole of the front foot is in contact with the ground, and furnishes a broader and firmer contact surface than is given by the heel of the projected foot in the erect gait. Straightening the leg at the knee is also instinctly avoided in active bent-knee gait, as it involves the muscular action necessary to raise the weight of the trunk—from a hundred to two hundred pounds. In a slow gait, however, straightening the leg affords relief to the thigh muscles, for the straightened leg sustains the weight of the superimposed trunk largely upon the bones and ligaments, while the bent leg needs the effort of the quadriceps muscles to sustain the superimposed weight.

In rapid flexion walking, with the constant shifting of the weight from one leg to another, this burden is lessened; but in a leisurely walk, with slow steps, the straightened leg and erect trunk, balanced at each step between the front and the rear foot, gives momentary muscular rest and lessens the labor involved in the raising of the trunk necessary to the straight-legged gait.



Fig. 1.—Diagram of erect gait at the moment of double support.



Fig. 2.—State militia officer marching in review. Drawn from a newspaper picture.

(N. Y. Med. Journal.)



Fig. 3.—Straight-leg gait, civilian.

(N. Y. Med. Journal.)



Fig. 4.—Straight-leg marching, United States Marines.

(N. Y. Med. Journal.)





Fig. 5.—Straight-leg marching. West Point Cadets.

(N. Y. Med. Journal.)

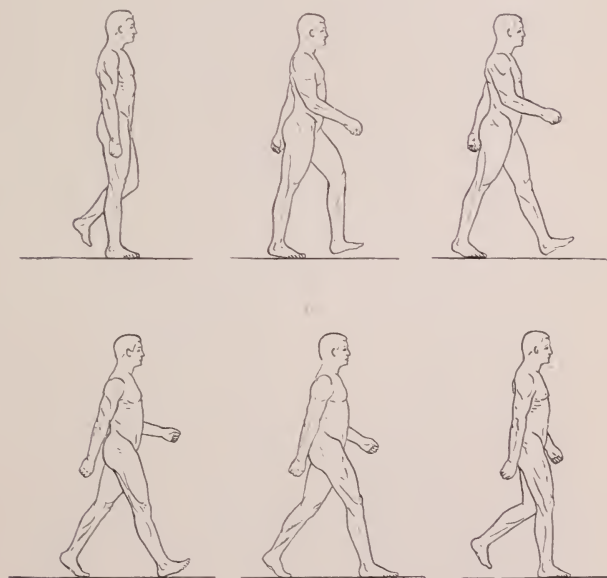


Fig. 6.

(N. Y. Med. Journal.)



In a rapid and long-continued march the strength expended in raising the trunk two inches at each step can be readily estimated as considerable. The front limb remains bent at the knee, as in this position the forefoot is at better advantage for the backward pressure of the limb employed in driving the trunk forward. The bent knee also furnishes less jar in checking the inclined trunk falling forward than if the leg was straight.

The erect or straight-leg gait is the gait of the dwellers of a city; it is the conventional gait, the gait of leisure, though it may become the rapid gait of the strong-legged. The inclined or bent-knee or flexion gait is the gait of rough country, of all who walk for a distance up to the limit of their strength, the gait of the strong-footed requiring strength also in the muscles of the front of the thigh. It is the gait instinctively taken by boys when endeavoring to keep up with older and larger pedestrians who are walking rapidly.

This has been termed the flexion gait, from the most noticeable feature—that is, the bent rather than the straightened leg; but less noticeable, but no less if not more important, is the position of the trunk inclined forward from the line of equilibrium, thereby utilizing the force of gravity as a propelling force. If the trunk is held erect while the knees are kept bent, the gait is both awkward and weak.

The gait is easily recognized, not only by the bent knee of the forward leg, the position of the head and shoulders well forward, nearly if not quite over the forward foot, but also by the lack of rise and fall of the trunk in the walk, and by the fact that the feet are kept nearly straight and not turned out, as happens if the thighs are well advanced in the erect gait by the psoas and iliacus muscles, which, inserted on the lesser trochanter, tend to rotate the limb outward.

It is evident that there are many gradations between these two well-marked types of locomotion, as well as individual peculiarities, and variations also in the rate of speed; but the rate of speed which can be acquired by the average man in the bent-knee is much greater than that attained by the straight-leg gait.

It is evident that the gait should be adapted to the purpose required. The individual on the floor of a ball-room, with footwear which binds the foot to a conventionalized shape, makes use

of a different step from that required in cross-country walking. The marching step is practically that required by individuals walking constantly over ground of irregular surface, as rapidly as is compatible with the capacity of the weaker members of the command, and the pedestrian in long walks should employ that in which his muscular force is used to best advantage.

The parade step may be left out of consideration in this inquiry. It will necessarily be more or less a matter of convention, dependent, as it is, upon military fashion, the views of the sovereign, the commanding officer, or the community before which parades are made, and will vary from Berlin to New York. The attempt to train soldiers in the straight-leg gait to strike the ground first with the sole and not the heel of the extended leg, the "parade schritt" of the Germans, is an example of this. The step requires training, indicates drill, but is not a useful one.

The question as to length of stride and cadence is also a question of drill. These vary with the height and strength of the individual and are learned instinctively in practice.¹

To quote from a writer in the New York Sun, May, 1899: "Men who served in the last war," said a member of the National Guard, "soon learned that the armory step was of little use in the field. The one was all right enough in its place, and even in the streets of New York; but in the field, where men want to keep their strength as much as possible, they soon learned that a bent knee and toes straight ahead were better than the stiff leg and toes out. The 'get-there' step is what we called it. . . . The high-stepping soldier is as little suited for long marches as the high-stepping horse for a race. To march effectively is one thing, 'to look pretty,' another.

"The upright posture is admired and taught to the soldier, but it is the one that demands the greatest expenditure of physical energy, and is the worst adapted for prolonged effort."

¹ The length of the ordinary step in the United States army is thirty inches, measuring from heel to heel, and the cadence is at the rate of a hundred and twenty steps a minute. This was formerly ninety steps of twenty-eight inches to the minute. The length of the full step in double time is thirty-six inches, and the cadence is at the rate of a hundred and eighty steps a minute.

The stride of the German soldier is thirty-one and a half inches, with a cadence of a hundred and twelve steps a minute. The French soldier has a stride two inches shorter and a cadence of a hundred and fifteen steps a minute.



Fig. 7.—Spanish officer. Drawn from a newspaper picture.

(N. Y. Med. Journal.)

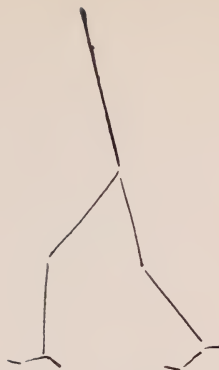


Fig. 8.—Flexion, inclined, or bent-knee gait.



Fig. 9.—Flexion gait, west coast of Africa. Drawn from a photograph.

(N. Y. Med. Journal.)



Fig. 10.—Inclined gait in child, west coast of Africa. Drawn from a photograph.



Fig. 11.—Flexion gait, Cuban volunteers.

(N. Y. Med. Journal.)



Where the ground is soft and the muscles of the soles of the feet are strong, the front of the foot, including the toes, can by muscular contraction of the sole muscles and of the flexor muscles of the toes exert a greater pressure upon the ground, and serve as a means in driving the body forward. Strong-footed individuals with moccasins on bare feet actually claw the ground in strong action in a manner analogous to the gait of bears or monkeys. This will be seen in strong-footed individuals walking up an incline or upon slippery ground. Where the flexion gait is carried out largely to the exclusion of the use of the rear foot in pushing, the muscles of the feet will be developed to a greater extent than the muscles of the calves of the legs, and this is commonly seen in barefooted savage races.¹

A valuable consideration of this subject was made a few years ago by French military writers, who developed and have advocated the flexion method of marching described, after studying the couriers of Algiers.

This gait, although in rapidity at times resembling a run, differs from a run, as both of the feet are never lifted off the ground at the same time. It does not tax the strength and circulation to the same degree as a run. The gait is analogous to what has been developed in individuals of all sandal-wearing or barefooted nations, who, as hunters and couriers, are obliged to cover long distances rapidly,² and is analogous to what has been termed the inclined or bent-knee gait.

French writers give the following description of the leg movements of this gait: "The knees must be always bent; the feet lifted no higher than necessary to clear the inequalities of the ground; the advancing foot must be placed flat on the ground, the step being made neither by the toe nor by the heel. The foot-fall should be noiseless, and the steps at first short and frequent. The body must lean well forward, the back must be straight and the head erect, the chest open and shoulders low."³

Dynamometric experiments are said to have shown that the foot does not press so heavily upon the ground as in the ordinary

¹ In the front foot of the Greek statue of the Discobolus the strong contraction of flexible toes to secure a hold upon the ground is well depicted. This can also be noticed in the wear of moccasins.

² *New York Nation*, July 23, 1896, p. 68, and Aug. 13, 1896, p. 122.

³ *Army and Navy Journal*, Sept. 9, 1899.

style of marching, and so, it is suggested, the man has more strength left to expend in propulsion; moreover, there is less of a jar at each step, and in place of the customary tramp of armed men, the tread is comparatively noiseless.¹

It is clear that this gait, which is to be employed where rapid movement is required, will be best used by people with strong and flexible feet and feet unimpeded by constricting shoe wear.² This is substantiated by historical facts. Morgan's Rangers in the Revolutionary War, with their moccasined feet, were able to show a surprising amount of marching activity, and in the Italian campaign in Abyssinia, Menelik's strong-footed troops showed activity to great advantage as compared with the Italian soldiers. An extraordinary march was made in 1885 in Peru by the troops under General Caceres along the Cordilleras to Chicla, which, according to reports, outclassed all records of forced marches by trained European soldiers.

From facts such as these it appears that in training for marching we have still much to learn from the moccasined and semicivilized nations. It will be suggested that as savages are habituated from early youth to an activity of foot, it is impossible that their record can be approached by civilized nations. This argument, however, is hardly convincing, as it has been proved that in all athletic contests civilized man, after training, is superior to a savage. If the proper methods of training are used, equally good results can be obtained. The civilized soldier should certainly not be hampered, however, by imperfect footwear, and by an imperfect system of training, which develops wrong muscles.

The method of physical development for the purpose is not difficult, as has been shown by French experience, and consists simply in training in what is termed "flexion" marching with proper shoes. The same can be accomplished in this country if similar measures are adopted.

"In France two officers, two sergeants and thirty men of a regiment were put under training at Nantes, and it is reported

¹ *New York Medical Journal*, Sept. 23, 1899, p. 454.

² Professor Shaler, of Harvard University, who has frequently tramped with North American Indians, tells me that a gait employed by them consists in lengthening the stride by throwing the pelvis forward. This is used occasionally in track walking matches and in short-legged walkers in an attempt to keep pace with longer-legged competitors, but cannot be utilized in long-distance marching.



Fig. 12.—Flexion gait, negro chain gang.
(N. Y. Med. Journal.)



Fig. 13.—Flexion marching, sailors from the Olympia.
(N. Y. Med. Journal.)

that, 'After three months' instruction, they marched, in the presence of General Fay, carrying their rifles, bayonets, one hundred rounds of ammunition per man, and food for one meal, along a hilly road, a distance of twelve miles and a half in an hour and forty-six minutes, which is at the rate of rather over seven miles an hour. Not one man fell out by the way. After a rest of two hours, they returned in three hours and five minutes, including two halts of ten minutes each, which gives an average speed of over four miles and a half an hour. Two days afterward these same men, in the presence of General Colonieu, in heavy marching order, covered a distance of six miles and seven-eighths across fields, on hilly ground, in an hour and twenty minutes, which works out at about five miles and a half an hour. At the end of their march they were at once told off to target practice, when their shooting proved superior to that of the best company of marksmen in the regiment; this was done to determine whether the exertions of their rapid march had injured their capabilities as riflemen.' "

The English writer in the *Contemporary Review*, 1899, shows that by proper training, "speed" may be acquired, and relates that a body of English reserve artillerymen, who were no longer young, after a course of eighteen lessons, marched five miles in forty-six minutes with their arms only, and two miles and a half in twenty-six minutes with full equipment.

The lessons, according to the French authorities,¹ need not be more frequent than two or three a week. A table is given of the distance to be traversed in each of the thirty-six lessons, beginning with three thousand yards and going up to twelve thousand; also showing how in the early lessons ten minutes is allowed for the first kilometre, nine and a half for the second, and seven and three-quarters for the third; these times steadily diminish with each lesson, as the pace increases, until finally the first kilometre, or five-eighths of a mile, is traveled in seven minutes and three-quarters, the second in six and a quarter, and the third in five and three-quarters. Now, one kilometre in five minutes and three-quarters is a good six and a half miles an hour. It is added that a three months' drill is necessary to thorough training in the "flexion" march.

¹ *Loc. cit.*

To enable, therefore, the individual to attain to considerable speed without fatigue, it is only necessary to develop certain powerful muscles not brought into action to a great extent in ordinary civic walking, and this from the evidence presented would appear to be easily possible.

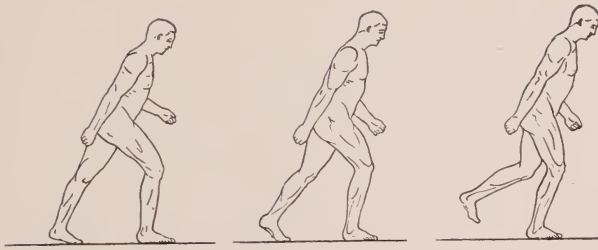
Anyone attempting this "flexion" or "bent-knee" gait will, after a little practice, be convinced of its value as well as of the obstacle to its adoption. The latter can be stated to be simply that it is not a gait which is in accordance with the accepted idea of marching or graceful walking.

A knowledge of the principles above mentioned is also of value to all interested in walking as an exercise, and in this connection the origin and development of the erect gait are of interest. In roadless communities, the feet and legs of the pedestrians are exercised in accordance with the muscular needs in locomotion on uneven ground, which by its inequality brings into play all the muscles that are used in walking. The footwear is either loose or the individual is barefooted, and the foot is not cramped; but in cities or towns where the footpath is even, and a leisurely gait is favored, the trunk is held erect and the rear leg, when advanced, is swung forward like a pendulum, striking the ground well in front of the axis of the trunk. This gait becomes the habitual gait, and is an easy one. Walking is deprived of its difficulties through the removal of obstructions and the even surface on which the individual walks. The individual is able to wear boots of a conventional shape which constrict and weaken the front of the foot without interfering with locomotion and without materially interfering with the gait. After the individual has become habituated to this gait, and the muscles necessary for this form of walking are developed, it becomes the customary means of pedestrianism, and where speed is required, or exercise is needed, the same form of gait is used, a gait which, however, demands an unnecessary expenditure of muscular force.

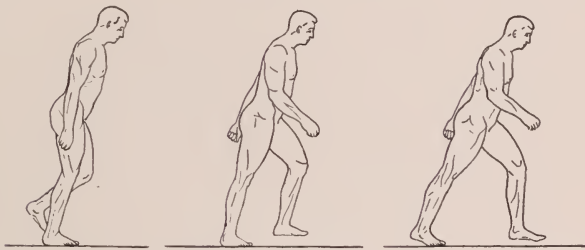
The flexion gait may be regarded as a natural gait, and should be acquired and practiced by all pedestrians, among whom walking is of service, either as a means of healthy exercise or as a necessity.

The subject is one well understood in the War Department, and is in practical use in the regular service, but it is desirable that

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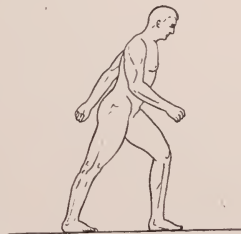


Fig. 14.

(N. Y. Med. Journal.)



those in charge of our State militia organization should consider it. Instruction and drill in marching with proper footwear, with contests between different organizations, could be introduced as rifle practice has been, and would be beneficial both to strength and to the efficiency of volunteer troops.¹

Richard H. Dana, the author of *Two Years Before the Mast*, an accurate observer, and except in early life accustomed to meet chiefly those habituated to urban or erect gait, graphically, though unconsciously, described the "forward gait" of General Grant, when the latter first came to Washington fresh from hard campaigning and years of frontier life. In connection with the Commander's lack of military bearing, he writes, "He does not march, nor quite walk—he pitches forward."

General Grant may stand for the great exemplar of modern war, which disregards convention, but utilizes all forces in accomplishing the desired end.² A careful economy of all strength is as useful in peace as in war, and is desirable in our sports as in our work. It should not be overlooked in the healthy exercise of pedestrianism.

¹ In this connection the recent performance of a seven-year-old bare-footed boy in Missouri deserves notice. He is reported to have walked twenty miles in four hours and a half (*Boston Globe*, Friday, October 6, 1899,) without fatigue, affording an illustration of the fact that the rising generation has native qualities which our civilization should not check.

² Rhodes. *History of the United States*, Vol. IV, p. 439.

XII. FIRST-AID PACKAGE IN MILITARY SURGERY.

BY COLONEL N. SENN,

CHICAGO.

SURGEON-GENERAL, ILLINOIS NATIONAL GUARD.

“THE fate of the wounded rests in the hands of the one who applies the first dressing.”

It is fortunate for the armed forces of the world, unfortunate for military surgery, that no great wars have occurred since antiseptic and aseptic surgery came into general use. During the time the Franco-Prussian war was fought, the last great war since our own great Civil Conflict, Lister was quietly at work framing the great principles which have recast the work of the surgeon. Antiseptic and aseptic surgery have not had as yet an extensive and fair trial on the battle-field. Carbolic acid solutions were employed to some extent by the German surgeons during the Franco-Prussian war, but Billroth's extensive observations in a number of large military hospitals led him to the conviction that they did not exert any special influence in the prevention of wound complications. As late as 1861, Strohmeier advised in his classical work on Military Surgery the use of a wet compress in the treatment of wounds on the battle-field, a method of treatment that had been in use from time to time since military surgery was practiced. The only innovation was a gutta-percha tissue cover over the compress, which was used for the purpose of retaining moisture until the patient could reach the field hospital, where the compress could be changed as often as was deemed necessary. This treatment was a decided improvement over some of the old methods, such as the common practice of stuffing the wounds with infected charpie, and the barbaric use of boiling oil, but it was a step backward, judging from the present standpoint of wound infection, from the treatment of wounds by the local use of turpentine, which at one time was sanctioned and extensively practiced by German military surgeons. The moist septic compress had a trial on the most extensive scale

during the Civil War, and we are familiar with the results. The terrible experience with gunshot wounds by all of the old methods of treatment turned the attention of military surgeons to the modern treatment of wounds as soon as it became well established in civil practice. The surgeons in civil life built the bridge across the river which separated the old from the new methods of wound treatment, and the military surgeons willingly followed the advance columns crossing it, eager and anxious to extend the benefits of the new discovery to the wounded soldier. The wars among civilized nations have been too few and on too small a scale to perfect the technique of aseptic surgery on the battle-field; a sufficient experience has, however, accumulated to warrant the statement that asepsis will eventually bring about as great changes in military surgery as it has already accomplished in civil practice. The first tentative efforts to practice asepsis in military surgery were made during the Russo-Turkish war. Reyher and von Bergmann, who took a conspicuous part during that campaign, made known promptly the results of their observations, and their writings laid the foundation for the modern treatment of gunshot wounds. Two things were brought out clearly during that war: 1. The value of a first-aid antiseptic occlusive dressing in the prevention of wound infection. 2. The importance of immediate immobilization of gunshot fractures.

It was during that war, too, that the too common practice of searching for and extracting bullets on the battle-field and in the hospitals was violently opposed, and strongly condemned by both Reyher and von Bergmann. The value of antiseptic and aseptic precautions in military practice has been demonstrated since that time on a limited scale in Bulgaria, Servia, Chili, Greece, Turkey, Japan and at different points in Africa in small engagements between the British, Italian and French troops, and the natives, and lastly during the recent Spanish-American War. It is evident that aseptic military surgery will never equal in its results aseptic civil surgery, owing to circumstances over which contending armies and governments have no control. Military surgery is and always will be emergency surgery. The difficulty in obtaining and transporting the necessary medical supplies, and, in large engagements, the number of wounded, render it impossible to follow out the aseptic precautions with the

same pedantic care as in private and hospital practice. Absolute asepsis in military surgery on the field is out of question for reasons that are apparent to anyone who has taken part during an active campaign. The limited experience of the past has, however, shown that the imperfect aseptic precautions which are applicable in the field have done much to minimize the horrors of war. The modern small caliber bullet inflicts wounds which are particularly well adapted to successful treatment by primary antiseptic occlusive dressing. All civilized nations have taken advantage of the modern treatment of wounds in their efforts to extend its benefits to military surgery. Suggestions from different sources in this direction came soon after antiseptic surgery became a generally recognized procedure. It is interesting to know what has been done in the way of recommendations for asepsis on the battle field. Antiseptic powders, sterile and medicated cotton, gauze, wood wool and other hygroscopic substances have been proposed. As antiseptics, iodoform, salicylic acid, carbolic acid, bichloride of mercury, chloride of zinc and salol have been most frequently mentioned and used. The many difficulties which are met with in war in the transportation of medical supplies make it necessary to restrict the requirements for procuring and maintaining asepsis to the minimum compatible with the immediate demands of the principles upon which it is based; that is, asepsis on the battle-field must be attempted by the employment of the most efficient and simplest precautions. The value of the first-aid dressing applied behind the fighting line by the wounded himself, his comrades or members of the hospital corps, is as yet not generally admitted. Legouest, Delorme and Nimier, French military surgeons, do not favor the first-aid package. Chauvel does not share their view, and makes a strong plea for its general introduction into military practice. But until 1889 no such packages were in use in the French army. Patin suggested the following first-aid package: One elastic bandage, one antiseptic gauze bandage, two graduated compresses of the same material enclosed first in paraffin paper, and as a cover, strong paper, made waterproof by linseed oil and a siccator. Bedoin proposed as a dressing material for first-aid, filtering paper sterilized by dry heat and immersion in a 1-1000 bichloride solution, to which a little glycerine is added, when the paper is slowly dried. Six to eight

layers are applied over the wound, besides cotton, and the dressing held in place by bandage. The package which he recommends for service in the field contains six sheets of antiseptic filtering paper, 40 cm. square, properly folded, a piece of gutta-percha tissue, 45 cm. square, in which the paper is wrapped, a thin rubber bandage from one to one and a half metres in length, and several safety pins. The package weighs 40 grammes.

Forgue recommends iodoform and cotton as an occlusive first-aid dressing.

The first-aid package of the French army in use at the present time is quadrangular in shape, the gray cloth wrapper bearing on one side printed directions for use. It is opened by extracting the thread used in sewing the wrapper. It contains an impermeable fabric, a small cushion of sublimated jute, a sublimated gauze compress, bandage and two safety pins.

Mosetig v. Moorhof advises dusting of the wound with iodoform, over which a gauze compress is applied, then mackintosh, or some other impermeable material, which is made to overlap the gauze for at least an inch, and over this a large hygroscopic dressing and bandage.

Wein recommends iodoform gauze between two layers of hygroscopic cotton wrapped in gutta-percha tissue in a compact package. Before applying the dressing, it is to be immersed in a strong solution of bichloride of mercury, or a carbolized solution to insure absolute asepticity, when the iodoform gauze is applied next to the wound, and over it the cotton, gutta-percha, and lastly the retaining bandage. Langenbuch advocated strongly the closure and sealing of the wounds by suturing and adhesive plaster, a part of the field service which he wished to assign to the litter-bearers. Lühe believed that this method of dealing with gunshot wounds would prove more effective if the wound were first dusted with iodoform or salicylic acid.

Port has modified the recommendations of Langenbuch in so far that he applies the adhesive plaster in the form of a Maltese cross, with a central opening the size of the bullet wound, which, when the plaster is in place, is covered with iodoform gauze and cotton for the purpose of guarding against retention of wound secretions. The margins of the gauze dressing are sealed to the surface with a rubber solution and the whole retained by strips

of adhesive plaster. In 1869, v. Esmarch devised the triangular bandage with printed illustrations for its use. During the early history of antiseptic surgery, he recommended balls of chloride of zinc jute, and later wipers of sublimated sawdust in gauze bags, for the field service. His typical first-aid package was a later product of his fertile brain. It consists of his bandage, two compresses of sublimated gauze, 10 cm. broad and 100 cm. long, each wrapped in waxed paper, and an antiseptic cambric bandage 10 cm. broad and 2 metres long. The whole package in rubber cloth weighs 100 grammes. According to Seydl, the first-aid package of the German army in 1893 contained a sublimate gauze bandage, 5 metres in length, two compresses of the same material, one safety pin, the whole wrapped in a compact form in waterproof linen cloth, which is sewed into the shirt of the uniform of officers and men.

In 1855, an order was issued in England from the Medical Department which required that a field dressing should form a component part of every British soldier's kit in active service, so as to be available at all times, and in all places, as a first dressing for wounds. The materials and form of the first field dressing were ordered to be as follows: Bandage of fine calico, 4 yards long, 3 inches wide; fine lint, 12 inches long, 3 inches wide; folded flat and fastened by four pins. It was ordered to be carried in the soldier's knapsack. During the Ashanti War, 1873-74, the dressing included a packet of lint, on which a little simple ointment had been spread, enclosed in waxed paper, a triangular bandage, two safety pins and a small packet of ordinary pins. The whole of these articles was folded into a small flat packet 4 inches by $3\frac{1}{2}$ inches by 1 inch in dimensions, which was covered by waxed paper. It was carried in a breast pocket, made of suitable size to contain it in the lining of the left side of the tunic. Later this package was ordered to be carried within a sewn-up pocket on the inside of the skirt of the soldier's jacket. Since 1891 the package is made up as follows: Within an outer gray, fine linen cover is a thin waterproof cambric inside cover, which is rendered air-tight by being cemented at the edges. Both covers can be readily opened when necessary. The inner cover contains two safety pins, a piece of waterproof cambric, 12 inches by 6 inches, and this encloses a gauze bandage $4\frac{1}{2}$ yards

long, folded flat into a package, 4 inches by $2\frac{1}{2}$ inches, a piece of gauze, 17 inches by 13 inches, also folded flat, and about 160 grains of compressed flax charpie between layers of gauze. All the dressing materials are rendered antiseptic by impregnation with bichloride of mercury, 1 in 1000. The weight of the complete dressing is two ounces.

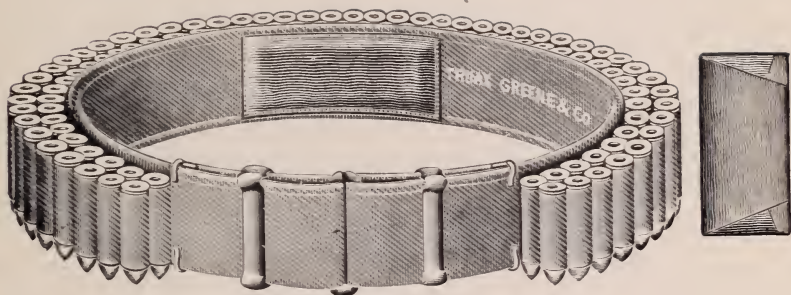
Metallic cases have been recommended for the safe keeping of the dressing materials by Majewski, Port and others. Port suggested a piece of tin which, when folded, would be about the size of an ordinary envelope, and which was to be sewed into the uniform over the region of the heart, for the double purpose of protecting this important organ against bullets, and at the same time serving as a case for the dressing material.

During the Spanish-American War the Surgeon-General issued 272,000 first-aid packages to the troops in Cuba and Porto Rico, and the soldiers in the home camps. Two kinds of packages were used. The one in pale red cover contained two antiseptic compresses of sublimate gauze in oiled paper, one antiseptic sublimated cambric bandage with safety pin, one triangular Esmarch bandage, with safety pin. Directions printed on package: "Place one of the compresses on the wound, removing the oiled paper. In cases of large wounds open the compress and cover the whole wound. Apply the antiseptic bandage over the compress. Then use the triangular bandage as shown by illustrations on the same." The other package in yellow cover contained the same materials and directions, but was different in shape, somewhat larger, narrower and thicker. All of the first-aid packages which have been described, including those furnished our own army, are too bulky for first aid dressing in the field. The packages used during the Spanish-American War did excellent service in the field hospitals, but there is no place in the uniform of the soldier where they would be tolerated for any length of time for the purpose for which they are intended. Longmore made the statement that during the Egyptian campaign, the first-aid packages issued to the troops were used for almost everything else except as a dressing for wounds. During my service in Camp Tanner, I supplied the Illinois troops with a small first-aid package, and every soldier left the State with one of these packages sewed into the skirt of the uniform on the left

side. These packages remained in place, and were often made use of in the treatment of accidental wounds. No definite conclusions have been reached as to the best place for these packages on the person of the soldier. The helmet, knapsack, the cartridge box, a hollow space in the butt of the gun, the uniform at a place over the heart, and the skirt have all been recommended as the most convenient place for carrying the package during an active campaign. As the officers and non-combatants do not carry a gun, some place in the uniform or the accoutrement must be found where such a package can be carried without inconvenience and without coming in conflict with military regulations. It must be stored in some part of the soldier's outfit which he is not likely to throw away during a forced march or in the heat of battle. The cartridge or sword belt is about the last thing a soldier will part with, and it is for this reason that a number of years ago I made the suggestion to sew the first-aid package in the middle and upon the inner side of the belt. (See Figure.) As the modern cartridge belt is made of canvas cloth, no difficulty presents itself in fastening the package by stitching it to its inner surface. Oiled linen cloth or thin leather would recommend itself for the outer wrapper. To be worn in this locality without objection on the part of the soldier or the military authorities, the package must be small. Large packages of any kind will never prove satisfactory as a first dressing in the field. The first-aid package for use in the field must meet the following requirements:

1. The material it contains for dressing the wound must not only be aseptic, but antiseptic.
2. The antiseptic used must be non-volatile and resistant to chemical changes for a long time.
3. It must contain a fixation material which will prevent displacement of the dressing after it has been applied.
4. Its size must be such as not to inconvenience the soldier or to prove a source of objection to the military authorities.
5. The dressing employed should not interfere with the free evaporation of the wound secretion.

As the quantity of dressing material must be necessarily limited in the dressing of gunshot wounds behind the fighting line, it is evident that better results will be obtained if it is impregnated with an antiseptic substance than if it is composed



First-aid package sewed inside belt.

simply of sterile material. Perfect asepsis on the battlefield is a happy dream which will probably never be realized. Disinfection of the wound and its immediate vicinity before the application of the dressing under such circumstances is absolutely out of the question. Bullet wounds should never be touched, much less explored, before the first aid dressing is applied. The necessity for the use of the antiseptic dressings in the treatment of recent gunshot wounds has been shown most conclusively by the ingenious experiments of Bogdan. This investigator showed by bacteriological experiments that the skins of soldiers protected by the regulation clothing, when in active service, contain on an average to every 5 square cm. 4429 pathogenic microbes, and he found by further investigation that in gunshot wounds treated by sterile dressing material, the microbes increased much more rapidly than under sublimated gauze. He studied the results of twenty-two dressings after twenty-four hours, and found that under the sterile dressing, the microbes had increased in the space of time mentioned to 780,729, and under the sublimated gauze to 19,668, the relative proportion of increase being 4:176 or 1:44. These experiments only prove what we would naturally expect, that the increase of microbes is diminished by the employment of antiseptic dressings in the treatment of wounds that can never be regarded as aseptic.

Carbolic acid is volatile, and is not adapted for dressings in the field. Corrosive sublimate, the most important antiseptic employed at the present time, is a very fickle chemical substance, prone to decomposition by chemical changes which destroy its antiseptic properties when incorporated in dry dressing material. Iodoform has no decided antiseptic properties, and cannot be relied upon in the protection of recent wounds against infection. Salicylic acid has been often proposed from different sources as the most valuable antiseptic for the first-aid dressing. Boric acid is another stable and valuable antiseptic, but cannot be relied upon exclusively as an antiseptic in a small dressing in preventing wound infection. For years I have relied on a combination of these two antiseptics as a drying, antiseptic powder, as an aid in the treatment of recent wounds. The formula used is boric acid, four parts, salicylic acid, one part. The line of suturing is covered with a layer of the boro-salicylic powder, deep enough to

bury the sutures out of sight before the hygroscopic sterile dressing is applied. The primary wound secretion dissolves a part of the powder applied, and the resulting antiseptic fluid resembles very closely in its effects Thiersch's solution, which has for good reasons become very popular as a safe, non-irritating and yet efficient antiseptic. Several years ago I recommended the borosalicylic powder in the above proportion as a valuable component part of the first-aid package, and an extensive experience has only served to strengthen my faith in its antiseptic properties. Fixation of the dressing by the triangular or roller bandage cannot be relied upon in preventing displacement of the dressing during the transportation of the patient from the field to the hospital. The dressing must be held in place by one or two strips of rubber adhesive plaster, which must constitute an essential component part of all future first-aid packages. The size of the package must be reduced to a minimum to do away with the most serious objections against its employment in field service, and this can be done only by selecting such materials as are essential in a primary dressing for small wounds. All primary dressings for recent gunshot wounds should be dry and nothing must be placed in the way of free evaporation of the wound secretion, hence all impermeable covers outside of the hygroscopic dressing must be abandoned. A dry dressing is one of the very best means of preventing wound infection, and nothing should interfere with the conversion of the wound secretion and dressing employed into a dry crust which hermetically seals the wound. Sterile absorbent cotton is far superior to gauze as a primary dressing for bullet wounds, as its hygroscopic capacity is much greater, and as at the same time it furnishes a more efficient filter for the exclusion from the wound of microbes from without. I would suggest the following first-aid package for field use and emergency work:

A soft, flexible package about $1\frac{3}{4}$ cm. in thickness, 6.5 cm. in width and 19 cm. in length. It consists of two drams of borosalicylic powder (4 to 1) in an aseptic fibrous paper envelope; two pieces of compressed cotton, each $2\frac{1}{2}$ by 4 inches; one piece of absorbent gauze triangular in shape, being one-half of a square yard; two safety pins attached to the gauze; two strips of rubber adhesive plaster, each 1 inch in width and 8 inches in

length. The whole, after being compressed under heavy pressure, is encased with aseptic precautions in a cover of thin mackintosh cloth and sealed with rubber cement. For military service the latter is included in a waterproof duck casing of sufficient width to allow the lateral margins to be stitched to the inner surface of the cartridge belt. The weight of the package, including the duck cover, is 710 grains; without the latter, 540 grains.

In using the package the powder is applied to the wound, when the lintine is used as a compress held in place by the strips of adhesive plaster and the gauze bandage over it. If two wounds are to be dressed at the same time, as is usually the case in modern warfare, the contents of the package are equally divided and used, which can be done without materially impairing the efficiency of the dressing. The slight hemorrhage in wounds inflicted by the small caliber bullet will soon saturate a part of the dressing, when evaporation will soon convert the antiseptic powder and the cotton into a dry antiseptic crust, the very best protection for the wound against infection.

The important question arises: Where and by whom should the first dressing be applied? A number of prominent military surgeons of the present time, among them Longmore, W. Roth, Wein and Tirok, are of the opinion that the first duty of the military surgeons when in action consists in concentrating their energies in providing for a speedy removal of the wounded from the firing line to a place of safety. It is their belief that little or nothing can be done in the way of treating wounds until this has been accomplished. Many of the military surgeons have expressed themselves recently as being opposed to the employment of the first-aid package by anyone except a medical man. This position will be found untenable during any great war, when the number of wounded would greatly exceed the working capacity of the limited number of surgeons. Additional and equally strong arguments against such limitation of the first-aid dressing behind the firing line are the well known facts that the sooner a recent wound is properly dressed, the greater is the probability of its remaining practically aseptic, and that the simple dressing proposed in this paper can be efficiently applied by any person of average intelligence who can be made to understand and follow the imperative rule never to touch the wound. Every soldier must be taught the

danger of hand contact, and the importance of the first-aid dressing and its manner of application. The trained hospital corps men of the future can be trusted with this part of the field service. I am confident that the prompt first-aid dressing applied by well instructed hospital corps men and litter-bearers will do more in the way of preventing wound infection than the delayed dressings in skilled hands. The clothing of the patient, if allowed to remain in contact with the wound for any length of time, is a very serious source of infection, probably nearly on a par with hand contact, and the sooner the wound is protected from it by the first aid dressing, the greater will be the chances of preventing infection. I fully agree with those who are opposed to the removal of clothing from the wounded part on the firing line for the purpose of inspecting and dressing the wound. The wounded must be removed to a place of safety as promptly as possible. The first-aid dressing can be applied in a few moments without the removal of any of the clothing except the shoes or boots in dressing wounds of the foot or lower part of the leg. In gunshot wounds of the extremities, the seam of the trousers can be ripped open sufficiently to expose the wound, the underclothing can be cut to the requisite extent to expose the wound or wounds sufficiently for the application of the first-aid dressing. The dressing is fixed in place with the strips of adhesive plaster, and the retaining bandage should be applied, not under, but over the clothing.

In dressing wounds of the chest, abdomen and pelvis, the dressing and bandage are applied in a similar manner. In gunshot fractures of the extremities, an extemporized fixation dressing of the simplest kind completes the first aid, and prepares the patient properly for transportation to the rear. The value of the first aid dressing became very apparent during the Cuban and Porto Rican campaigns. One thing that was supplied liberally and timely by the Medical Department was first-aid dressings, and to this we must attribute largely the speedy healing of most of the gunshot injuries and the few wound complications which later required operative interference.

In conclusion I would emphasize the following:

1. First-aid packages are indispensable on the battle-field in modern warfare.

2. The first-aid dressing must be sufficiently compact and light to be carried in the skirt of the uniform, or on the inner surface of the cartridge or sword belt to be of no inconvenience to the soldier or in conflict with military regulations.

3. The Esmarch triangular bandage is of great value in the school of instruction, but as a component part of the first-aid package it is inferior to the gauze bandage.

4. The first-aid package must contain in a waxed aseptic envelope an antiseptic powder, such as boro-salicylic powder, two strips of aseptic lintine, each $2\frac{1}{2}$ by 4 inches; a triangular piece of gauze the diagonal half of a square yard; sterilized pins wrapped in tin foil, and between this package and the outside impermeable cover, two strips of adhesive plaster an inch wide and eight inches long.

5. The first-aid dressing must be applied as soon as possible after the receipt of the injury, a part of the field service which can be safely entrusted to competent hospital corps men.

6. The first-aid dressing, if employed behind the firing line, should be applied without removal of the clothing over the injured part, and fastened to the surface of the skin with strips of rubber adhesive plaster, the bandage being applied over and not under the clothing.

7. The first-aid dressing must be dry and should remain so by dispensing with an impermeable cover of any kind over it, so as not to interfere with free evaporation of the wound secretion.

8. The first-aid dressing should not be disturbed unnecessarily, but any defects should be corrected at the first dressing station.

XIII. THE ARMY HOSPITAL TRAIN DURING THE SPANISH-AMERICAN WAR.

BY MAJOR CHARLES RICHARD,
SURGEON, U. S. ARMY.

THE Army Hospital Train was organized and equipped early in the war for the purpose of transporting sick and wounded from the commands in the field to the general hospitals. These were established at or near military posts, and were easily accessible by rail or boat.

The principal work of the train consisted in carrying sick from the camps in the South, though two trips were made with wounded from Santiago, who were taken from transports at Port Tampa, Fla.

The train was made up of ten hospital cars, a dining car, a combination baggage car, and a private car, thirteen cars in all. The private car was used as quarters for the officers on duty with the train. The combination baggage car contained two compartments, one of which was used as a store-room, in which were carried patients' baggage, stores, tents, bedding, litters, tools, etc.; the other compartment was used as the train office and dispensary. The equipment carried consisted of Field Chests, Medical, Nos. 1 and 2; Surgical, Nos. 1 and 2; Sterilizer Chest, and a Field operating table. The chests were found to answer every purpose; they are compact, well supplied with the necessary instruments, dressings and medicines. Most of the medicines are in tablet form and are easily dispensed, a matter of considerable importance on a rapidly moving railroad train.

The hospital cars, chartered from the Pullman Company, were of the type known as tourist sleeping cars, with upper and lower berths to each section. Some of the cars had twenty-four berths, others twenty-eight, so that the capacity of the train for patients was about 240. Patients who required special care could only be properly attended in lower berths; some of these were always reserved for patients who were unable to sit up during the day; consequently the full capacity of the train was rarely ap-

proached, besides, overcrowding, for obvious reasons, was to be avoided as much as possible.

The tourist car differs from the so-called palace car in having the seats covered with cane instead of plush, lower bulkheads between the berths, and the passage way through the car is straight from door to door, all of which features are advantageous in the care and handling of sick or wounded.

The cars had neither hangings nor carpets. The beds were supplied with mattresses, pillows, blankets, sheets and pillow cases, and each car was provided with bed-pans, urinals, cuspidors and other appliances needed in a hospital ward. The cars were supplied with water tanks, both for drinking and bathing purposes, and had the usual toilet facilities. Had there been time to plan and build special cars for this service, no doubt a much better type could have been devised, but these fulfilled their purpose admirably. They were neither elegant nor luxurious, but they were easily kept clean, readily ventilated and comfortable.

The dining car was one of the larger Pullman dining cars, such as are used in the passenger service of railroads. It contained a compact but complete kitchen, had ample refrigerating boxes, and was well supplied with cooking utensils and appliances, crockery, and table ware. The dining compartment had a seating capacity of forty-eight. The cars were without bedding, linen, utensils, table ware or crockery, when turned over to the Medical Department; these furnishings were specially purchased for this service.

The personnel of the train consisted of one Surgeon, one Assistant Surgeon, who was also Quartermaster, one Hospital Steward, one Acting Hospital Steward, twenty privates of the Hospital Corps, and three civilian employes; two of the latter were employed as cooks, and the third as a waiter, who was charged with the general supervision of the service in the dining car. The entire force of the train, whether it was moving or lying idle, was subsisted and quartered upon the train. The usual military routine was observed in the same manner as if the detachment were in camp or garrison.

Rations in kind were drawn for the detachment and employes; the rations for the sick were commuted at the rate of

sixty cents per day, special authority having been granted by the Secretary of War in the case of the Hospital Train, prior to the promulgation of General Order No. 116, of 1898. The two officers on duty with the train conducted their mess in the private car.

The train was subject only to the orders of the Surgeon-General of the Army, who communicated his instructions by telegraph directly to the Commanding Officer of the train; the latter reported, by the same means, every movement made by the train. As soon as orders were received for the train to proceed after the sick, the Chief Surgeon of the command from which the sick were to be taken, was notified by telegraph of the probable time of its arrival. Likewise, before moving out with its load, the Commanding Officer of the General Hospital to which the patients had been ordered, was notified of the time when the train would probably reach his hospital.

Upon reaching the point where patients were to be received, the cars were cleaned, water tanks were filled, ice and such other supplies as were needed placed aboard, and beds prepared. At the same time, the Quartermaster made his arrangements with the railroad company for the return movement of the train, so that as soon as its complement of patients had been received, the train was ready to depart on its journey.

The cars were loaded by the Hospital Corps detachment of the train; the train was broken between every second car, sufficient space being allowed between the cars to permit of easy handling of the litter; one squad passed the litter up on to the platform, one end passing into the door; from here it was taken by another squad of two men, who carried it into the car, and with the assistance of a third, transferred the patient to the bed. Some preliminary drill had been given the detachment in this work, and that, with the practical experience gained in loading many cases, made them quite expert, so that they could easily load a hundred litter patients in less than three hours.

As the patients arrived at the train, each was briefly examined by the Medical Officer, name, rank, and organization recorded, and instructions given as to whether he was to be placed in an upper or lower berth. The baggage of patients, when properly tied and labelled, was taken to the baggage car;

if not properly marked or tied, it was taken into the car with them, properly arranged and marked, and sent to the baggage car subsequently. If a bed patient came clothed, his clothing was removed, and a nightshirt put on him. If he needed a bath, and I regret to say that in not a few cases it was necessary, he was given a sponge bath, as there were no facilities for giving tub baths. Patients who were allowed to sit up during the day, were required to don nightshirts on retiring. The attendant on duty in the car recorded the name, rank and organization of each patient that he received, and made out an identification tag which was attached to the patient. In all cases of fever or suspected fever, he recorded the patient's temperature.

Beef tea and milk were issued to the patients on their reception on the train, if needed, but no solid food was permitted until it had been specifically ordered by a Medical Officer. This precaution was necessary owing to the large number of typhoid fever cases that were generally carried. Patients were invited to turn in money and valuables for safe keeping; these were placed in separate envelopes, marked and sealed and deposited in the safe.

Usually, by the time the last patient was put aboard, the train was ready to pull out, as every effort was made to hold the patients on the train for the shortest possible time. When the loading was completed, the Medical Officers made their professional visits; every patient was examined, and prescribed for if necessary; his diet was ordered, his wounds dressed, if required, and the diagnosis of each case recorded; occasionally it was found necessary to perform minor operations. While en route, the usual hospital routine was observed; regular morning and evening visits made, and the seriously ill visited as often as deemed necessary. The Commanding Officer of the train made a final tour of inspection usually before midnight.

The discharges of all patients suffering from typhoid fever, diarrhea and dysentery were disinfected, as were likewise the sputa of patients suffering from diseases of the lungs. Bed linen that had become infected was disinfected in corrosive sublimate solution, while infected mattresses were burned.

Upon the arrival of the train at its destination, the sick were unloaded by the train detachment and turned over to the attend-

ants of the receiving hospital, or loaded into electric cars for further transportation to the receiving hospital. When all patients had been removed, the train was taken to a railroad yard, where the cars were thoroughly washed out, soiled linen collected and sent to the laundry, and orders awaited. When these were received, preparations were made for the return movement, stores purchased and transportation arranged, and the train was ready to move out as soon as the engine and crew reported.

When the train first went into operation, transportation was secured through the local Quartermaster at the point where the train might be. This entailed so many delays, to say nothing of vexations, that upon representation of the utter futility of trying to make the service efficient by this method of securing transportation, the Assistant Surgeon of the train was detailed as Acting Assistant Quartermaster, with authority to issue transportation requests on the order of the Commanding Officer. The rate to be paid the railroad companies was fixed by the Quartermaster's Department, and all roads over which the train traveled willingly accepted it. No further delays on this account occurred.

Another instance where the Medical Department should act as its own Quartermaster.

Typhoid patients constituted nearly sixty per cent. of all those transported. In general, the patients stood the journey well, in spite of trying heat and dust during the summer months, but cases of typhoid fever in the height of the disease, whose vital resources had already been heavily drawn upon, fared badly. In these, the diarrhea and abdominal distress were aggravated and the general exhaustion became more marked, while no doubt the liability to intestinal hemorrhage was increased. Several deaths occurred among this class of patients, and it was evident that they were not proper ones for transportation; instructions were then given the Commanding Officer of the train by the Surgeon-General to reject all cases that in his opinion would not bear transportation safely. Medical Officers, transferring patients to the train, were also directed to exercise greater care in the selection, and as a result no further deaths took place.

Typhoid fever cases in the first week of the disease and in the convalescent stage were not unfavorably affected; in fact, the latter class often showed decided improvement, which was no

doubt due to the change and the anticipation of nearing home. The wounded likewise did well, and no evil effects resulting from the journey were noted among these.

The different points at which patients were received were as follows: Tampa, Port Tampa, Fernandina and Jacksonville, Florida; Chickamauga, Savannah, Americus and Columbia, Georgia; Bristow, Virginia; New London, Connecticut; Jersey City, New Jersey; Philadelphia, Reading and Harrisburg, Pennsylvania; Lexington, Kentucky, and Knoxville, Tennessee. The general hospitals to which patients were taken were those at Fort McPherson, Georgia; Fort Thomas, Kentucky; Fortress Monroe, Virginia; Washington Barracks, District of Columbia; Fort Meyer, Virginia; Plattsburg Barracks, New York, and the Josiah Simpson General Hospital near Fortress Monroe, Virginia. The longest trip was that from Port Tampa, Florida, to Fort Thomas, near Newport, Kentucky, a distance of 1100 miles, the time consumed in making the journey being approximately forty-eight hours.

The Hospital Train was fitted out in Washington, D. C., and left that point on its initial trip on June 17th., 1898; its last trip was completed on March 4th., 1899. Thus the train was in operation nearly nine months, and during the first six of these months was almost continuously in motion, except when undergoing repairs. By the close of the year it had transported 4,570 patients and had traveled a distance of 42,175 miles; the average number of patients transported per trip during this period was 127; the greatest number carried on any single trip was 235; when finally discontinued in March, 1899, its record shows 4,704 patients, 2,781 of which were cases of typhoid fever, and a mileage of 44,110 miles. But five deaths occurred on the train; three of these were cases of typhoid fever, in two of which the immediate cause was exhaustion, in the third, intestinal hemorrhage. One patient, suffering from gunshot wound of the neck, died apparently of cerebral embolism; the fifth death, in an alcoholic patient, was due to surgical shock and delirium, following amputation of the leg for railroad injury.

This extended detail of the service illustrates the fact that the Hospital Train was not merely a railroad ambulance, but a moving hospital; the work it performed demonstrates that

severely sick and wounded, when properly selected, can be safely transported over long distances, and at the same time receive hospital care and treatment.

The duties were arduous, fatiguing and always exacting, and in closing, I cannot refrain from speaking of the faithful work, cheerfully and conscientiously performed, both by the Medical Officers and the entire force of the train.

XIV. POISON IVY AND ITS KINDRED—WITH REMARKS ON OTHER SKIN-POISONING PLANTS.

BY MAJOR VALERY HAVARD,

SURGEON, U. S. ARMY.

POISON Ivy is such an abundant and dangerous weed in North America, often incapacitating from duty a notable proportion of officers and men at posts, in camps and on the march, that a paper on this subject may be deemed of some military value and therefore an acceptable contribution to the Association.

The *Anacardiaceae*, or Poison Ivy Family, is a large and important family of wide distribution all over the world, but most abundant in tropical and subtropical regions. It furnishes such useful plants as *Pistacia vera* (Pistache), *Shinus molle* (Peppertree), *Mangifera Indica* (Mango-tree), *Anacardium occidentale* (Cashew-tree), etc. On the other hand, many species have an acrid caustic juice often causing irritation and inflammation of the skin; this dangerous juice is specially found in *Rhus* (Sumach), a large genus growing in nearly every part of the globe and represented in North America, north of Mexico, by at least seventeen species. These species are not all poisonous; some appear to be quite harmless, for instance, the section characterized by a large compact terminal head of red fruit, including such common plants as *R. glabra* (Smooth Sumach), *R. hirta* (Staghorn Sumach), and *R. copallina* (Dwarf Sumach), in which the acid fruit is used to make a pleasant cooling drink, while the leaves and bark are excellent tanning material. A Pacific coast species, with simple leaves, *R. ovata*, has (says Orcutt) a fruit whose very sour pulp becomes covered with a thin crust of delicious sugar, so that Indians obtain from it all the ingredients of lemonade.

The poisonous section of *Rhus* is characterized by inconspicuous flowers in loose slender clusters or panicles in the axils of the leaves, and grayish-white or yellowish dry fruit. The leaves are either trifoliate; that is, consisting of three leaflets like

clover, or else pinnate; that is, with the leaflets arranged along each side of a common stalk. To the trifoliate group belongs Poison Ivy.

The correct botanical name of Poison Ivy is *Rhus radicans* under which it was first described by Linnæus, the name *R. toxicodendron* applied by several authors being apparently intended by Linnæus for a different southern species; but even if these two names be synonymous, that is, referable to the same plant, *radicans* being described before the other in the *Species Plantarum*, has the right of priority. Poison Ivy is such a variable plant that some botanists have been inclined to make two species of it, or at least to distinguish one or two varieties; but longer and more careful observation has shown that its many variations are but the natural and accidental effects of soil, exposure and environment; thus from the same stock we may have stout erect stems 4-6 feet high, and deeply toothed leaves ("Poison Oak"), together with high climbing vines bearing entire leaves; therefore only one species is admissible, without variations sufficient to justify any botanical variety.

Each leaf consists of three leaflets; these are ovate or lozenge-shaped, 1-4 inches long, entire or toothed, pointed, the lateral ones short-stalked and inequilateral, the terminal one longer-stalked. As thus described, the leaves are absolutely characteristic, so that anybody having once looked at a clump of Poison Ivy should be able forever afterward to recognize the plant and never to confound it with anything else. The only shrub with trifoliate leaves in the country, growing as large as Poison Ivy, is *Ptelea trifoliata* (Hop-tree or Shrubby Trefoil), often a small tree, always erect, never climbing, and with round, broadly-winged fruit. The vine often found in company with Poison Ivy is *Ampelopsis quinquefolia* (Virginia Creeper), but the plants are very different, the only common feature being that they both climb; Virginia Creeper has five leaflets instead of three, all of which spread out from a common point like the rays of a fan, and bears conspicuous clusters of purplish-black, juicy berries. It is in fall, winter and spring, after the leaves have fallen, that the plants might be confounded; in Poison Ivy the branchlets are slender, beset more or less with brownish hair-like rootlets, while the leaf-scars are narrow and sharply angular; in Virginia Creeper the branchlets

are thicker, with knobby joints, conspicuous round leaf-scars and (instead of rootlets) tendrils opposite some of the leaf-scars. This ability to recognize branches of Poison Ivy in winter is of importance since they are practically as poisonous in one season as in another.

Poison Ivy generally climbs if there is any support within reach, clinging to it by means of abundant long fine aerial rootlets; it thus may reach the top of large trees, with spiral stem sometimes 3-4 inches in diameter, and, if able to get plenty of moisture, becomes very ornamental with a dense mass of dark green, glossy foliage. It is one of the most widespread of shrubs ranging from Nova Scotia across the continent to British Columbia; within the United States it is abundant in the East, but does not extend beyond the Rocky Mountains, except in the Southwest, where it reaches Texas and Utah. It is very hardy, thriving in all soils under the most diverse and adverse climatic conditions, showing a wonderful aptitude of accommodation, and quite difficult of extermination.

It is our best known and most dreaded vegetable cutaneous poison, producing by contact severe eczematous eruption and inflammation. The incubation period (between time of contact and first appearance of inflammation) is usually four or five days, ranging from twenty-four hours to nine days. There is at first, itching, becoming more and more violent, redness and swelling, accompanied with heat and slight fever; then we notice the development of small vesicles, sometimes well marked but never as characteristic as in eczema, not seldom few and inconspicuous. The primary contact is almost invariably with the hands, but as the skin is comparatively tough and thick, it remains unaffected; the poison takes effect wherever carried by the hands, provided the skin touched be susceptible to its action; the thinner and more delicate the skin, the more readily affected; this is why the eyelids suffer most and generally first; thence the inflammation extends more or less, sometimes involving the whole face and neck, so that the patient may be unable for several days to open his eyes. This inflammation, if left to itself, lasts four or five days and then begins to subside, with a discharge of the vesicles and some desquamation of the skin, a complete cure usually resulting within ten or twenty days.

What is the poisonous principle? This has long remained doubtful; in 1865, Prof. Maisch discovered that the exhalations of the plant have an acid reaction, and described the acid which he obtained as toxicodendric acid, attributing to it all the irritating properties of the plant. This was accepted until last year when Prof. Franz Pfaff of the Harvard Medical School, after a long series of careful experiments, demonstrated that toxicodendric acid is nothing but acetic acid, while the poisonous agent is a fixed oil which he calls *Toxicodendrol*. It is readily prepared in an impure state (contaminated with another but harmless oil and resinous matter) by extracting the plant with alcohol, distilling off the alcohol, washing the black, oily residue with water and taking it up in ether; the ethereal solution is then washed with water, a dilute solution of sodium carbonate and again with water; by evaporating the ether an oily substance of very dark color is obtained. In this crude state, amounting to 3.3 per cent. in the leaves, and 3.6 per cent. in the fruit, it readily produces the well known lesions occurring after contact with the plant. In its pure state, toxicodendrol is a most virulent irritant, affecting all people in the minutest doses; thus, in Prof. Pfaff's experiments, even 1-1000 of a milligram dissolved in two drops of olive oil proved to be active in one person.

All parts of Poison Ivy contain toxicodendrol *at all seasons* and are therefore *always* poisonous, the fruit, leaves and roots most so, but even the bare winter vines cannot be handled with impunity; drying lessens slightly but does not eliminate the poison, so that stems cut off and thrown away are still dangerous years afterward. Most people are affected by the juice of the plant rubbed on the skin, but the proportion of persons really susceptible and affected by ordinary contact is small; a warm temperature and perspiration increase the susceptibility; complexion of skin has no effect upon it.

Now comes a pertinent question. If the poisonous principle is non-volatile and only acts by actual contact, whence comes the very general belief that Poison Ivy produces its effects, on susceptible persons, at a distance, without touch, as it were, by exhalations? The answer is:

First. That actual contact with the poison is necessary but not contact with the plant, and that the poison may be conveyed

in various ways ; thus any person, animal or object having touched the leaves or stems may carry the poison many days afterward to persons who have been nowhere near the plant ; a hand-shake is quite enough. Quite recently, a severe case of face poisoning came to my notice, of a lady who, in her outings, never left the sidewalk ; it turned out, on inquiry, that she had caressed a pet dog that had been running through a thicket of Poison Ivy.

Second. That the pollen is a conveyor of the poison ; the plant is in bloom in May and June, and the abundant pollen is then undoubtedly blown about long distances ; the amount of toxicodendrol thus disseminated can only be infinitesimal, but when we consider its acute virulence, it seems probable enough that susceptible persons are thus reached somewhat in the same manner that hay-fever patients are taken ill on or about August 20th., when the Ragweed (*Ambrosia artemisiaefolia*) blooms out and scatters its pollen.

The treatment is preventive and curative. So far as practicable Poison Ivy should be pulled up and eradicated ; mere cutting of the stems will not do, stronger shoots would spring forth later in the season ; the roots must be dug up. In the second place, all persons handling Poison Ivy should carefully wash their hands with soap, and then, if possible, with alcohol or ether, so as to remove all traces of adhering poison ; they should do that, whether susceptible or not, in order that they may not communicate it to others.

The fact of poisoning is only known, of course, after appearance of the incipient symptoms of itching, redness and swelling ; then the first indication is to remove at once all the oil still clinging to the skin, so as to limit to a minimum the area of inflammation and prevent its spreading. For that purpose, the skin should be well washed and scrubbed with warm water and soap, then with alcohol or ether which dissolves the oil and carries it off. This being done, we apply a solution (the stronger the better) of acetate of lead which forms with the oil a neutral harmless compound. In a few words, we first remove as much of the poison as possible with soap and alcohol, and then neutralize the remainder with lead. The addition of opium to the lead will be useful to relieve the pain. The best application is probably the old-fashioned lead and opium wash which contains also alcohol, a

valuable adjunct in any step of the treatment. It is thus seen that, in the use of lead and opium wash, scientific investigation leads to the same results as practical experience. Let us remember that the inflammation is restricted to the point touched by the oil and immediate vicinity; therefore we know that no spreading of it will occur spontaneously; let the patient then abstain from rubbing or scratching the affected part lest he carry the poison to other places; above all, let him beware of touching his eyelids if not already involved.

There are facts on record which would seem to show that a patient having once suffered from Poison Ivy may have recurrences of the inflammation without fresh contact. These recurrences may be at any time during the year following the primary attack, or may take place periodically, every year, at about the same season. It is so utterly difficult with our present knowledge of the toxic principle of Poison Ivy, to account for such recurrence, that one feels somewhat incredulous about it, and, for my part, I shall wait for more carefully observed facts before considering it a demonstrated phenomenon.

The properties of this plant, taken internally, are feeble and very uncertain; toxicodendrol seems to have no appreciable effect upon mucous membranes. The leaves are official in the United States Pharmacopeia, but there is no reliable evidence anywhere that they have been found useful in any disease, acute or chronic. I have myself administered a strong tincture of the leaves to several patients without any noticeable results.

Horses and cattle are rather fond of the foliage and eat it with impunity; crows and other birds feed on the berries, thus helping in disseminating the plant.

ITS KINDRED.

Rhus toxicodendron is the southern Poison Ivy, differing only by the obtusely crenately-lobed leaves and larger fruit in smaller clusters; until recently it had been considered a mere form of the common species, and has exactly the same properties.

Rhus diversiloba, the California Poison Ivy or Poison Oak, is our third species with trifoliate leaves, and is distinguished by the rounded, obtuse, less sharply toothed leaflets, and looser longer-peduncled panicles. It ranges from British Columbia to Southern

California, being specially abundant in the coast ranges. Its name of Poison Oak is tolerably justified by the resemblance of the leaves to those of some Live Oaks. It is exactly as dangerous as our Eastern species and, although not yet chemically investigated, there is every reason to believe that the poisonous principle is identical.

The other poisonous species of *Rhus* belong to the section with pinnate leaves, that is, with several leaflets on each side of the stalk; the most notorious is:

Rhus vernix (*R. venenata*), Poison Sumach or Poison Elder, a large shrub or sometimes small tree, the trunk 6-8 inches in diameter, the leaves consisting of 7-13 obovate-oblong entire leaflets. It ranges from New England to Georgia and Alabama, west to Minnesota, Missouri and Arkansas.

This species is acknowledged to be even worse than Poison Ivy, more persons being affected on coming in contact with it. Fortunately it is not very common, being confined to shady, damp woods. The active principle is also an oil apparently identical with toxicodendrol and existing in greater quantity (F. Pfaff). Bigelow refers to an account of bees being killed by swarming upon this plant. The cut stem exudes an ill-smelling juice which may be used as indelible ink; it yields, after boiling, a glossy black, durable varnish. The foliage assumes brilliant tints in autumn, when unsuspecting people often gather and handle it.

Rhus Michauxii (*R. pumila*), is a small erect shrub of the Southern States, with eleven leaflets; it is said to be very poisonous but, being rare and local, has no importance.

Of foreign poisonous species, with pinnate leaves, two may be mentioned because occasionally planted for ornament in California and the Southern States, *R. vernicifera*, the Lacquer or Varnish-tree of Japan, with viscid resinous juice used in the manufacture of lacquer ware, and *R. succedanea*, Japanese Wax-tree, whose berries yield much wax used for making candles.

OTHER SKIN-POISONING PLANTS.

Many other plants are more or less poisonous to the touch, producing inflammation of the skin with or without vesication, but, compared to species of *Rhus*, rather unimportant and not needing extended mention. They may be divided into three

classes: First, those like Poison Ivy, in which the poisonous principle, volatile or non-volatile, is contained in a clear watery juice; second, those, like Bloodroot and Celandine, in which the poisonous principle is contained in a thick milky juice; third, those, like Nettle, in which the poisonous principle is contained in hairs or prickles.

First. Among those of the first class, with non-volatile poison, a remarkable one is the common Parsnip (*Pastinaca sativa*), the foliage of which is distinctly poisonous, so that workmen on large seed-farms are always cautioned to wear gloves when handling it. Assistant Surgeon Charles F. Mason, U. S. A., while on duty at West Point, N. Y., noted that all persons working in the Parsnip field were affected. The inflammation is very closely like that of Poison Ivy and probably caused by an analogous oil. It may be here stated that the roots of wild Parsnip, popularly believed to be very dangerous when eaten, are really perfectly harmless, and that the deadly toxic effects attributed to them should be ascribed to those of Water Hemlock (*Cicuta maculata*) mistaken for it.

Another common plant of the same family, the Cow Parsnip (*Heracleum lanatum*), is also a cutaneous irritant, probably containing the same active poison.

Of plants with watery acrid juice containing a volatile skin poison, we have many representatives in the large family *Ranunculaceae*, including Buttercups, Anemones, Pulsatillas, etc. It is well known that in Europe, beggars rub the leaves of several species of Buttercups on their skin to produce deep ulcers and thus arouse the commiseration of the public. The poison evaporates rather rapidly so that unless the plant is well rubbed in, or the spot protected against evaporation, inflammation is not sure to ensue. All these plants become perfectly innocent after being dried, therein widely differing from the species of *Rhus*.

Second. In this class of plants, the abundant, more or less acrid milky juice freely exudes when the bark is incised or any part broken. This juice, rubbed on the skin, is more or less irritant and may produce serious sores. Such plants are most common in the *Euphorbia* Family to which belongs the famous Manchineel-tree of the West Indies and Florida, under whose very shade it is not safe to lie. It is apparently on account of their

thick milky juice, much rather than from the result of scientific experiment, that several species of *Euphorbia* are reputed, by Mexicans, absolutely sure antidotes against rattlesnake bites. This juice is also a popular, although vain, remedy for the removal of freckles, causing much swelling, pain and sometimes ulceration, without any of the desired effects upon the complexion.

Third. In these plants, most common in the Nettle Family, the poisoning is effected through the agency of prickly hairs. If we examine the leaf of a Nettle, we find it beset with several kinds of hairs, some quite harmless but others decidedly otherwise; the latter consist of a basal bulb formed of secreting cells, and an awl-shaped filament with expanded and bent summit; the hollow filament and summit are filled with an acrid acid liquid formerly thought to be formic acid, but now recognized as a non-volatile albuminoid substance. The bent summit readily breaks in contact with the skin, and the liquid is poured into the puncture, producing the well known symptoms of urtication, in which we seldom have any vesication.

Other plants of this class are our native species of Lady's Slipper, specially the handsomest of them, *Cypripedium spectabile*, covered with minute hairs, many of which are glandular-tipped, filled with acid contents and capable of producing a kind of urtication. Let us also mention *Primula obconica*, one of the prettiest and most popular of Primroses, but which must be handled with gloves on account of the hard poisonous hairs covering it.

XV. SOME OBSERVATIONS ON THE GAUZE TREATMENT OF SUPPURATION OF THE MIDDLE EAR, DURING AND SINCE THE SPANISH WAR.

BY MAJOR CHARLES M. ROBERTSON,
LATE CHIEF SURGEON OF VOLUNTEERS.

I WAS much interested before entering the service in certain articles which had appeared concerning the "gauze" treatment, as it is called, of suppurative diseases of the middle ear, and had been trying its efficacy when I was called to join my regiment. I kept it in mind, however, and after becoming established in hospital service in the South, had abundant opportunity to apply it to both acute and chronic cases of suppurative otitis media.

Of the cases treated, most were of an acute form, following typhoid fever, mumps or measles, although there were cases of middle ear suppuration from inflammation of the membrana tympani, as a result of sea-bathing, and from traumatic causes. It was my aim to take a clear and uncompromising stand in the test of this treatment, so that my statistics could not be mixed, and thus rendered of no value, as most have been heretofore, from the fact that most authors have used fluids in part, in what they called "gauze" treatment. Gauze treatment then, should mean, treatment without any procedure used in the moist method; hence, syringing the ear with mild antiseptic solutions,¹ or the use of sedative mixtures,² would not belong to this form of procedure.

All writers that I have known have used what I should term, moist, or semi-moist treatment, and not the "gauze" or what might be called the new "dry" treatment as used by myself. In the moist treatment, syringing followed by peroxide, and then perhaps the drying with cotton pledgets, and dusting in of powders is used. In semi-moist or semi-dry treatment, there is the use of the syringe to remove all secretion or discharge from the ear, followed by the use of peroxide and alcohol, either medicated or plain, and the

¹ Modern therapy of suppurative otitis media. Goldstein, *Laryngoscope*, Dec., 1898.

² Report of gauze treatment in suppurative otitis media. H. Wyging, *Semaine med.*, Dec. 14, 1898.

use of gauze packing, preceded or not by the use of powders. In the gauze method, as used by myself, the syringing is not used at all, the discharge being wiped away with sterilized pledgets of cotton on an applicator, after which the gauze is placed so as to produce drainage. Where the perforation is large enough, the gauze is passed into the middle ear, and if not, it rests against the perforation, great care being taken not to pack the gauze too firmly, as in so doing we destroy to a certain extent the capillary drainage. Different gauzes were used, but we could not see but that the hygroscopic was as efficient as any. The iodoform gauze is objectionable from its odor, aside from its poisonous qualities, to so many individuals. It was suggested that we try the lactate of silver gauze, but the suggestion has as yet been unheeded. If the sterilized gauze is replaced often enough, there is, in my opinion, no particular indication for its medication, as the discharge is drained off as fast as it appears. In most of the cases I wish to report, the patients were exhausted and impoverished by the great degree of heat endured and the absence of good nutritious diet. In the cases following measles especially did the discharge disappear and the perforation close rapidly. The average number of days of treatment was from four to eleven. The typhoid patients were more liable to extensive perforation of the drum-membrane and required longer to heal, the average being from ten to thirty days.³ Some few cases were not entirely cured, and were placed on other treatment. Of the cases resulting from sea-bathing, few lasted longer than from three to five days. Traumatic rupture of the membrane was relieved, where discharge was present, in from one to five days. In all cases where fluid was found in the middle ear with bulging of the membrane, paracentesis of the lower posterior quadrant was performed and the results were thereby better than had it gone on to spontaneous rupture. All cases were seen once, twice or oftener daily, as the amount of discharge warranted; the gauze being replaced as soon as it became saturated with secretion. The strips used were one-quarter of an inch wide, and three or four inches long, according to the lumen of the meatus for which they were intended. So pleased was I with this simple drainage, that since returning from the army I have tried it in suppuration of the middle ear, whether

³ It was proven that these cases called typhoid were of typho-malarial fever.

acute or chronic. Two hundred or more cases have been observed, both in the clinic of the Iowa University and in my private practice.

In ordinary cases of acute suppuration, the same results attend as in army hospital service. Acute cases, especially after paracentesis of the drum-membrane, recovered much more rapidly than with the moist method. Several cases of chronic suppuration of years' standing have recovered, that resisted the moist treatment. This form of treatment, of course, admits of the same watchfulness of the diseased conditions of the nose and nasopharynx, as in other methods. The removal of granulations and polypi in the middle ear, and the surgical treatment of necrosis, if such exist, either by the curette or by one of the mastoid operations, should be practiced. I have, however, tried the efficacy of the gauze in the presence of chronic granulations, and have been gratified to see them dry up under its influence, and at times completely disappear in twenty-four hours without the use of curette or snare. This is especially true if the granulation tissue is painted with a four per cent. solution of extract of suprarenal capsule.⁴ The gauze should be replaced often enough to avoid odor, as Dr. Gradle has correctly said that "so long as odor exists there is present decomposing discharge, and so soon as odor is absent we are safe in assuming that no decomposing discharge exists."

In an article by Dr. H. Wyging, of Copenhagen,⁵ on treatment by gauze packings, he states that "twenty aseptic tampons of cotton, each wrapped in paper, and the whole placed in a bag of filter paper, are given to the patient, instructing him to take one from the bag and introduce it into the external auditory canal." He states that "the otorrhœa was thus cured in two or three weeks." This suggestion is good, provided the patient is intelligent enough to carry it into effect. However, his tampon would be better if it were made of gauze rather than cotton. In

⁴ The action of supra-renal capsule extract is to exsanguinate the part, by contracting the arteriole. The effect lasts from one half to four hours, and is of great advantage in surgical procedure on all mucous membranes; especially when the part is liable to be lost sight of on account of bleeding. The application of cocaine followed by the use of extract of supra-renal capsule relieves pain and prevents bleeding. It must of course be an antiseptic solution.

⁵ Report of gauze treatment in suppurative otitis media. H. Wyging, *Semaine med.*, Dec. 14, 1898.

nearly all the cases treated no Politzeration was used, the discharge in the middle ear when thick and ropy being removed into the external auditory canal by the Siegel otoscope. In many instances similar cases were treated, in one ear, by the moist or semi-moist method, and in the other by the gauze; and the time of treatment of each noted. It was almost without exception, of shorter duration on the side where pure drainage was used. In four cases there were mastoid symptoms (pain over the mastoid process and elevation of temperature). Of these none came to operation, the application of an ice-bag, together with drainage, causing the symptoms to disappear in from one to three days, the otitis media resulting in permanent cure. These four cases were following typhoid.

We may say in conclusion: 1. In the gauze method, no fluids whatever were used. 2. The gauze should be placed loosely in the external meatus, the inner end just touching the perforation. Any packing has the effect of producing obstruction to discharges which is opposed to the plan of treatment, namely, capillary drainage. 3. Where the perforation in the drum-membrane is small, it should be enlarged to assist in carrying out the principle of drainage. In cutting the membrane it is well to cut toward the meatal wall, and, where possible, down to the floor of the middle ear. 4. All surgical measures should be adopted that are practiced in other methods of treatment, viz., the removal of polypi, granulations, necrosed bone, etc. 5. The nose and nasopharynx demand both medical and surgical treatment in this method, as in all other methods. Treatment of the middle ear should always mean treatment of these parts in whatsoever disease of the ear we are called to treat.

XVI. CASE OF EPITHELIOMA OF TONGUE AND LEFT SUPERIOR MAXILLA, APPARENTLY CURED BY APPLICATIONS OF FORMALIN LOCALLY, AND INTERSTITIALLY, WITH INTERNAL ALTERATIVE AND TONIC TREATMENT.¹

BY CAPTAIN G. W. WOODS,
MEDICAL DIRECTOR, U. S. NAVY.

WALLACE, WILLIAM A., Pay Clerk, U. S. N., æt. 54 years. In June, 1898, the patient first noticed a swelling at the back part of his right upper jaw, which was painful and ulcerating, and which hampered the movements of his lower jaw. The last molar on that side was removed on account of pain. The ulceration progressed and on admission February 9, 1899, his condition was as follows: Cachectic; weight 135 pounds, a loss of about fifty pounds; denies syphilis, but has a scar on penis. The cervical and submaxillary glands are enlarged. Mouth foul smelling; can separate his incisors about three-fourths of an inch. An ulcerating growth, microscopically epitheliomatous, involves the following parts on the right side: Superior alveolar process as far forward as the median line, the soft palate tonsil, posterior pillar of the fauces and pharynx wall adjoining. In the fold between the molar alveolar ridge and the cheek is a deep fissure surrounded by infiltrated tissue. The patient had received anti-syphilitic treatment for a long period prior to admission without benefit. The patient's condition was deemed such that an operation for removal of the invaded parts was out of the question.

Before admission patient had been under the professional care of Dr. G. Lenox Curtis of New York City, a competent physician and surgeon, who gave a very favorable prognosis. He recognized the disease as epitheliomatous, and having had most favorable results in other apparently identical cases under a certain course of treatment, applied it at once to the case of Mr. Wallace. This treatment consisted of daily so-called electrical sepsis treatment; a form of bath and system of treatment, the invention of Judge John Rooney and associates, who had formed a joint stock company, and in addition local and general (internal) treatment these remedies being prepared by a New York pharmacist, a graduate of Bellevue College who declined, however, to make known the secrets of his preparations.

¹ From records of U. S. Naval Hospital, Brooklyn, N. Y.

This treatment was continued for a considerable period, Mr. Wallace growing progressively worse, and on May 15, after consultation with Dr. Curtis, with his consent and approval, was discontinued, he pronouncing the case hopeless. Dr. Curtis had frequently submitted sections of the growth for our examination, which were clearly epitheliomatous tissue, and recognizing that no hope lay in the pursuit of the present treatment instituted by him, desired to close his connection with the case.

At this time, the growth had extended in all directions, extending across the middle line in front and through soft palate, involving pillars of the fauces and right pharynx wall. The right ramus, and right alveolar process of the inferior maxilla were invaded. The patient's general condition was bad; he could scarcely stand and was pallid and cachectic.

The new treatment now inaugurated was as follows: Locally, formalin, 5 per cent. freely applied twice daily after cocaine, as parts were very sensitive. Hypodermatically, atropia sulphate, gr. 1-150; morphia sulphate, gr. 1-16, for pain at bedtime. The hypodermic was discontinued after about two weeks.

He was given nourishing fluid and semi-fluid diet, with stimulants. He was also given a bath and massage at 7 p. m. daily, often with alcohol.

Under this treatment the local and general conditions improved steadily. On June 29, a small pocket of pus over the right canine fossa was opened and drained. The ulceration in the mouth began to heal anteriorly where the formalin could be best applied. He was directed to gargle with the formalin from time to time. July 20, the parotid gland suppurated and a deep dissection behind the jaw, with release of the pus, was made, under anesthesia. The patient has steadily gained in weight and strength and the cachexia is less apparent.

It was necessary to remove the incisors from the upper jaw. The ulceration has completely healed except at a point the size of a dime internal to the posterior extremity of the alveolar ridge on the right side.

His antrum is invaded, but by draining anteriorly and frequent irrigations the condition is improving. No change in treatment until August 1, when 5 per cent. formaldehyde-glycerine was applied locally and injected into the antrum instead of the watery formaldehyde solution. No evidences of epithelial conditions remain.

XVII. THE CANTEEN.

BY LIEUTENANT HERBERT A. ARNOLD,
ASSISTANT SURGEON, N. G. PA., (LATE ASSISTANT
SURGEON, U. S. V.)

PRIOR to 1892 the co-operative store for the benefit of enlisted men had received both officially and unofficially the designation Post Canteen.

By General Orders No. 11, Adjutant General's Office, February 8, 1892, the designation Post Exchange was adopted in place of Post Canteen.

General Orders No. 46, Adjutant General's Office, July 25, 1895, publishes Post Exchange Regulations.

Paragraph 9 describes Exchange features, which in an Exchange doing its full work should embrace the following sections:

- (a) A well-stocked general store.
- (b) A well-kept lunch counter.
- (c) A *canteen* at which, under the conditions hereinafter set forth, beer and light wines by the drink, and tobaccos, may be sold.
- (d) Reading and recreation rooms.

Paragraph 10 prohibits the sale of ardent spirits in any branch of the Exchange, but on recommendation of the Exchange Council, provides for the sale of beer and light wines by the drink. This paragraph also says the canteen must be in a room used for no other purpose and, when practicable, in a building apart from that in which the recreation and reading rooms are located; the sale of beer must be limited to week days, and the beer consumed upon the premises. The practice known as "treating" will not be permitted.

Thus we see the *canteen* recognized as a *department* of the Post Exchange since 1892.

Post Exchange Regulations of 1895 governed the operation of the Exchange until March, 1899.

The excellent paper on "The Post Exchange, from a Medical Standpoint," by Major Harvey, U. S. Army, read at the Buffalo meeting of this body, presents a very thorough consideration of

its bearing upon the health of the troops, the only aspect of the subject properly presentable to this Association.

Viewed from this standpoint, the beneficial features of the Post Exchange, as compared with the old system of supply by Post-traders, are conceded without argument. A possible exception to this statement is the canteen feature, which has been subjected to violent attack, especially since the outbreak of the Spanish-American war.

With the massing of large bodies of volunteers at Camps Meade, Alger, Thomas, etc., the canteen feature was adopted by many volunteer regiments, not, however, under the strict Army Regulations, and in most instances without regarding the latter clause of paragraph 9, which says: "at every Exchange there should be no less than two departments; the refreshment, embracing store, lunch counter and canteen, and the recreation, which includes all the other branches."

With little or no attempt at conformity to the regular Army system, the volunteers have in most instances canteens only, designated beer or temperance canteens, according to the articles dispensed there. In the temperance canteens pies, ice cream, lemonade, milk, iced tea, coffee, wild cherry phosphate, a drink made of vinegar and water and various other soft drinks, euphoniouly called "belly washes," have been the principal articles sold; while other regiments maintained their canteens only for the purpose of regulating the sale of beer and other malt liquors.

Lax regulations among undisciplined troops necessarily occasioned some excesses, and the system was made to bear the responsibility, which perhaps more properly should have been borne by commanding officers. Visitors to the camps witnessed the excesses and carried the news throughout the home neighborhood.

Synods, presbyteries, associations and other religious bodies joined hands with prohibition organizations in passing denunciatory resolutions. The newspapers spread these resolutions before their readers, and further enlightened them by wise editorials. Committees waited upon the President and memorialized Congress, and March 2, 1899, an Act was approved providing as follows:

"No officer or private soldier shall be detailed to sell intoxicating drinks, as a bartender or otherwise, in any post exchange or canteen, nor shall any other person be required or allowed to sell such liquors in any encampment or fort or on any premises used for military purposes by the United States; and the Secretary of War is hereby directed to issue such general order as may be necessary to carry the provisions of this section into full force and effect."

During the brief debate before the House, the advocates of the Act claimed the support of Major Generals Miles, Wheeler and Shafter, Adjutant General Corbin and many other prominent officers in both the regular and volunteer army. Few Medical Officers are numbered among those whose opinions were supposed to influence the vote upon the measure, and but little defence was made for the canteen. Some misapprehension of the character of the canteen appeared to exist, judging by language made use of during the discussion.

After the passage of the Act, the Secretary of War requested the opinion of the Attorney General as to whether it prohibited the continuance of the sale of intoxicating drinks by the Government in the canteen section of the Post Exchange.

The Attorney General in his reply held that the Act in question does not prohibit the continuance of the sale of intoxicating drinks through the canteen sections as heretofore organized and carried on, except that no officer or enlisted man can be detailed for duty in the canteen section to do the selling.

This interpretation evoked such a storm of indignation from the disappointed advocates of the Act that the Secretary of War sent out, May 2, 1899, through commanding officers of posts and departments, a circular of interrogatories to ascertain the views of officers of the Army in regard to the usefulness of the Post Exchange or Canteen and its effect upon the morale and discipline of the Army. It called for a report from the commanding officers of every troop, battery, company and regiment, based upon experience and observation, as regards the benefit or injury to the Army in point of temperance, morality or discipline as a result of the Exchange system, and particularly as to the sale of beer.

After stating that it has been publicly asserted by the opponents of the Exchange system that officers of the Army are restrained from expressing their true opinion on the subject by reason of the belief that the War Department has determined to maintain the Exchange in spite of opposition, the Secretary invites the utmost latitude of opinion, in order that he may be in a position to utilize the information obtained in response to the interrogatories in the preparation of a report which will present to Congress the merits and defects of the exchange system, as seen by those who are best qualified to judge.

Following are the questions:

What opportunity, if any, have you had to observe the working of the canteen feature of the exchange system?

What has been its effect upon the morality of the enlisted men?

What upon the discipline?

Have desertions increased or lessened since its introduction?

Are court-martials more or less frequent?

Has drunkenness increased or lessened?

Does the opportunity to procure beer in the post or in camps have any effect upon the efforts of enlisted men to procure intoxicants outside?

What would be the effect of an absolute prohibition of the sale of beer in the army?

Are you in favor of such prohibition or are you in favor of the exchange as now conducted?

How can the exchange be improved?

Make any additional observations calculated to fully inform the Secretary of your views in general on the subject.

A circular of interrogatories, similar in character, was in contemplation for the purpose of presenting to this body the views of Medical Officers familiar with the practical workings of the canteen, but it was deemed inexpedient to anticipate the report to the Secretary of War.

Individual expressions of opinion obtained last Summer and Fall from Medical Officers and others who had opportunity for observing the manner of conducting the canteens of the volunteer organizations tend to controvert the views expressed during Congressional debate.

This information referred more particularly to the First and Fourth Ohio, and the Fourth and Sixteenth Pennsylvania Volunteer regiments, all having beer canteens at Camp Thomas, and the Third and Fifth Illinois and other regiments with temperance canteens.

One of these regiments was in camp two months, with little sickness. A change in regimental officers resulted in the men being limited to one glass of beer each day. About one week later they had a marked increase in sickness, very soon followed by the first death in the regiment. A comparison of the consolidated reports of sick in the above and other organizations at Camp Thomas for the month of July, 1898, stating character of canteen, if any, would be very interesting as well as helpful in throwing light upon this vexatious problem.

The soil at Camp Thomas was mostly clay, underlaid with gravel, which in turn rested on another layer of clay. The wells found a water supply in this gravel. It was simply surface water, which, after washing stable, sink and latrine, percolated through openings worn in the clay, to rest in the gravel until pumped up for drinking or culinary purposes.

Officers of strictly temperate habits, some of them using no liquors at all, unhesitatingly stated that the bottled and keg beer was a safe drink, and much more wholesome than the contaminated milk or the soft drinks, many of which were prepared in the immediate vicinity of the camp, without regard to the unwholesomeness of the water used.

The milk supply, according to a Chattanooga banker, was never adequate to the requirements of the city. Notwithstanding this fact, it was suddenly expanded and made equal to the demands of fifty thousand men. That sold throughout the camp by peddlers was, perhaps, the most objectionable, being of uncertain origin, composition and quality. One of Chattanooga's ablest physicians (Dr. Baxter) believed the milk supply largely responsible for the prevalence of typhoid at Camp Thomas.

Be that as it may, the officers referred to were of the opinion that the dangerous infectious diseases, such as typhoid fever, developed most in regiments where they had temperance canteens, and where the men were the most liberal patrons of hucksters of soft drinks, warm fruits and vegetables.

These same officers also state that most of the drunkenness witnessed by them was caused by spirituous liquors procured outside the camp.

In at least one instance the canteen came into collision with the State authorities. The case was tried before Hon. John W. Simonton, President Judge, Court of Quarter Sessions, Dauphin County, Pennsylvania, June 17, 1899.

The charge was selling liquor without a license.

The evidence showed that at the canteen of the U. S. Engineers, at Camp Meade, a Sergeant and two civilians (one a recently discharged soldier) were engaged in conducting the business of selling liquor, under the authority of the officer in command of the camp at that time, who claimed that the canteen was instituted by him by authority of the U. S. Army Regulations.

One of the witnesses was a civilian, a detective, employed by the Anti-Saloon League of Pennsylvania. He swore that he purchased liquor at the canteen, without question, although he was in civilian dress. His appearance was almost clerical, and was enough to put the most reckless bartender on his guard. There was other evidence of sales to civilians.

The Court charged the jury to the effect that such sales as were proved were in violation of the Act of Congress of June 13, 1890, Supplement to Revised Statutes, Vol. 1, page 757, which provides:

"That no alcoholic liquors, beer or wine, shall be sold or supplied to the enlisted men in any canteen, or post trader's store, or in any room or building at any garrison or military post, *in any state or territory in which the sale of alcoholic liquors, beer or wine is prohibited by law.*" The Court instructed the jury that the laws of Pennsylvania prohibited the sale of such articles without a license, and if they believed the uncontradicted evidence of the Commonwealth, they should convict the defendants.

The jury convicted, and the Court suspended the sentence, with the understanding that if there was any further violation of the liquor laws at Camp Meade, the present defendants should be called for sentence, they agreeing to discontinue the canteen.

The canteen in the Navy is a thing of the past. Hon. John D. Long, Secretary of the Navy, February 3, 1899, issued the following order:

"After mature deliberation, the Department has decided that it is for the best interest of the service that the sale or issue to enlisted men of malt or other alcoholic liquors on board ships of the Navy, or within the limits of naval stations, be prohibited."

"Therefore, after the receipt of this order, commanding officers and commandants are forbidden to allow any malt or other alcoholic liquor to be sold to or issued to enlisted men, either on board ship or within the limits of navy yards, naval stations or marine barracks, except in the medical department."

The canteen question has been receiving consideration by other nations, as will be shown by the Dutch Minister of War, in his report upon the sale of liquor. The Hollanders have been noted for their drinking habits, and yet this report declares that a few sensible restrictions only are needed, as the use of intoxicants is decreasing, at least, so far as the Army is concerned, and that there is a corresponding increase in the consumption of tea and coffee. The following interesting quotation is taken from the *Handelsblad*, Amsterdam, and gives in part the Minister's report on observations taken in the camp at Reijen:

"There were three military canteens, where beer, coffee, milk and spirits could be purchased. Strong drink was sold between 8 and 9 p. m.; also one hour before dinner to non-commissioned officers, and three-quarters of an hour before dinner to privates. The commanders, considering good beer a better beverage than gin, made special arrangements with the contractor as regards quality. This was done not only with a view to the men, but also to the women attached to cantonments, washerwomen, etc. In the camp at Reijen, where special investigations were made, beer was preferred to such an extent that only one out of nine persons took a drink of gin, on an average, per day. The men were not allowed to leave camp; it was therefore possible to make reliable calculations. During eleven days 133 liters of strong drink were consumed by 2,108 rank and file. Beer was consumed to the extent of one-fourth liter per head per day (little more than half a pint.) There was not a single case of drunkenness, although the sale of beer was not restricted."

In view of these facts, the Minister believes that the inherent temperance of the Dutch people should be trusted, their moderation should be encouraged by sensible restrictions, but total

prohibition of the sale of strong drink is not to be recommended, as it does not produce so good results as moderate restriction.

That there may be no misunderstanding as to the motive for any apparent defense of the beer canteen, it may be in order for me to state that its abolition would occasion no deprivation so far as I personally am concerned, for I never used it, either in the volunteer service or at any of the annual camps of the Pennsylvania National Guard.

This explanation is made to substantiate the claim of an unbiased presentation of the canteen question, holding conclusions *sub judice*, in view of the inquiry instituted by the Secretary of War.

XVIII. PHYSICAL STANDARDS OF NATIONAL GUARDSMEN.

BY BRIG. GEN. J. FRANCIS CALEF,

SURGEON-GENERAL, N. G. CONN.

POLITICAL history demonstrates that every nation has frequent crises in its affairs, when the show of armed force is necessary. Ability to rapidly mobilize a formidable fighting force makes for peace. Industrially and commercially that country is the strongest which can spare the largest percentage of its men to civil employments. The policy of territorial expansion beyond seas, by whatever form of government adopted, has always required a larger military establishment than would have been required had the same territory been contiguous to the mother-land.

This country must then, in its present situation, be either equipped with a large standing army or cultivate within its industrial class those qualities of mind and body which best prepare for service under arms. The Military Surgeon has a duty to perform in enlightening the public as to the exact physical qualifications for service in the regular army, and to point out how the youth may develop themselves so as to make good soldiers if their country calls.

Before discussing the qualifications for service in the National Guard, permit me briefly to call to mind the duties for which they must prepare themselves. They represent the moral and physical force upon which the Governor of the State depends for preservation of law and order, to suppress riots and insurrections and to repel invasion. The dignity and responsibility of such duties need not be dwelt upon but should always be incorporated into the very being of the citizen soldier. Any personal sacrifice he may make is as nothing when compared with the good of the service and the honor of his State. But the real duty of the guardsmen does not stop at the State line when the Nation is involved in war. They should be the first in the Volunteer service and whether they go out as regiments or individuals should be left to the War Department. There the prob-

able scope of the war is better known than anywhere else. If few regiments are required they may be called out en masse. If many will be needed, separate enlistments are preferred since skeleton regiments of guardsmen can be filled with raw recruits.

The difference between ordinary National Guard discipline and that of the Army on war footing has to be reckoned with in the officering of troops in the field. The better the discipline in any regiment and the more closely the physique of it conforms to the regular army standard, the more likely is it, in the case of need, to be called out with its own officers.

It may be conceded that some of the functions of the National Guard may be just as well performed by men not up to the Army standard in every particular. For service in street riots, where action must be at close quarters, the high standard of eyesight is not required, and dependence on glasses does not impair a man's usefulness. Here, the same maturity and seasoning are not imperative. The troops are usually quartered in comfortable barracks or camped in very favorable locations, and many of the hardships of field service avoided. The National guardsman will probably not see hard service, and a very important part of his work will be to develop his physique so he can do the full work of a soldier. The bones, muscles and vital organs have not developed fully enough, before the age of twenty-two years, for the severe work involved in active service, but it is acknowledged that younger men more readily acquire the drill and habits of discipline so necessary for the soldier. The recruit should therefore be enlisted at eighteen or nineteen years if sound, and possessed of a physique promising the full army standard at maturity. To that end, a careful physical examination should be made and the record preserved. After two or three years of weekly drills and two or three short seasons of actual work in camp, the guardsmen should be eligible to enlistment in a body of men, selected with the greatest care as to mental, moral and physical qualifications, of mature age and with considerable military experience to begin with. They should be enlisted and equipped for active service at any time and might be called "Minute Men" or "Veteran Guards." Their Colonel, at least, should be a regular Army officer and they should each year have a tour of duty for at least a month at some regular

army post. For these men the standard of the United States Army in time of peace is none too high.

For the ordinary National Guardsman we will consider in what respects the army standard may be departed from without endangering the efficacy of the Guards. For many reasons a minimum qualification should be advocated and all men who can reasonably be expected to develop up to the required standard, upon devoting themselves to the drills, should be accepted. On the other hand all who would be likely to break down at the first severe test must be rejected. Beside the exact physical condition of the recruit, his family and personal history must be investigated and the diseases from which he has suffered, considered. With these favorable we may, after a careful physical examination and accurate measurement of height, weight and chest description and measurements predict very accurately what the average youth of eighteen will be at twenty-two. Upon this postulate I shall base the following outlines: At twenty-two he may be expected to be from one to two inches taller in total height. The distance from the center of the symphysis pubis to the upper border of the breast bone is a most important measurement and one which taken with the girth at the navel and horizontally at the angle of the scapulæ at inspiration forms the basis for a very accurate calculation of the capacity of the space occupied by the organs of circulation, respiration and nutrition. This sterno-pubic measurement has the advantage of but slight variation between eighteen and twenty-two. The chest at inspiration will average one and one-third inches more at the latter age and the girth of the abdomen have increased slightly less. The total height may be expected to increase about an inch mainly by the natural growth and ossification of the epiphyses. (chiefly the lower epiphysis of the femur and the upper epiphyses of tibia and fibula.) Since complete union of these epiphyses does not always take place before the age of twenty-five, height may be increased by lengthening of the legs up to that age.

WEIGHT.—The average weight for the American male at the age of twenty-two will be estimated by allowing two pounds for each inch up to 67 inches, and five pounds for every inch above this. At twenty-five the same rule holds true, only seven pounds per inch above 67 inches has to be figured. About twenty-five

pounds above and below these averages seem to be incompatible with good health and physical vigor, yet when the recruit's weight approaches either of these extremes his physical examination should be made most circumspectly, particularly if the younger man approaches the maximum or the older one the minimum. If the minimum figures are approached without other explanation a urine analysis should be made to exclude diabetes, and symptoms of tapeworm should be looked for. In approaching the maximum, the ratio of adipose tissue to muscle should be estimated.

Actuaries of life insurance companies have made a close study of the relations of height to weight in reference to longevity in civil life and their most approved table is given below :

Height.	Minimum weight.	Maximum weight.
63 in.	106 lbs.	160 lbs.
64 "	111 "	167 "
65 "	114 "	170 "
66 "	116 "	174 "
67 "	118 "	178 "
68 "	124 "	186 "
69 "	130 "	194 "
70 "	135 "	203 "
71 "	139 "	209 "
72 "	142 "	214 "
73 "	147 "	220 "
74 "	151 "	226 "

In applying these figures to military use, it must be remembered that these are in ordinary clothing, and a reduction of about 1-18 must be made to allow for clothing.

XIX. MY CONVERSION FROM CONSERVATISM TO EARLY SURGICAL INTERFERENCE IN APPENDICITIS.—A SKETCH.

BY MAJOR A. C. GIRARD,

SURGEON, U. S. ARMY.

THE paper I have the honor of submitting to you was written at the quiet military post of Fort Douglas, near Salt Lake City, before the blowing up of the "Maine," and before any one not in the confidence of the Administration had any expectation of war. I was preparing to go to Madrid to represent the Government at the International Congress of Hygiene, and was timing my return so as to meet you in this city on the 29th. of May last year. But man proposes and God disposes. At that time I was in the field with the 2d. Army Corps, and for a year had my tent for an abiding place. On being relieved I was ordered to inspect, equip and organize a large General Hospital at the Presidio, San Francisco, and had no time for literary work, and therefore venture to submit this paper. I hope from the large material at my disposal to glean for the next meeting results of importance for military surgery.

About eighteen months ago I was present at a meeting of the Salt Lake County Medical Society, where appendicitis was the subject of discussion. Opinions as to the necessity of early operations were divided, a strong advocate of the affirmative being Dr. H. D. Niles, a rather young looking practitioner, who some seven years before had established himself as a specialist in abdominal and pelvic diseases. I was amazed at the positiveness with which he enunciated what I then supposed to be extreme views. A number of practitioners present, mostly of the younger class, spoke of their operations for appendicitis, and I began to fear that the *furor operativus* had seized upon my civilian confreres of the city of Salt Lake. I kept as concealed as possible, but was discovered by the vigilant eye of the president, and was requested for my views on the subject. Reluctantly I arose and stated that I had practiced my profession in the Army for

thirty-two years, had never lost a patient from appendicitis as far as I knew, and I was pretty apt to know, as I had availed myself of the facilities we have in the Army for post-mortems in every possible instance, and would have known, even in the ante-appendicitis days, if a patient had died of perityphlitis, peritonitis, or some similar disorder. I therefore confessed ignorance of the existence of appendicitis so far as my experience was concerned.

My skepticism was destined to receive a rude shock inside of twelve months. In a few weeks a corporal of the 16th. Infantry, who had just returned from a practice march, reported sick with intestinal colic, some vomiting, slight increase of temperature, and on palpation I discovered rigidity of the abdominal walls, great tenderness on pressure over McBurney's point, and the distinct sensation of a hard swelling. I diagnosed acute appendicitis, and, to make a long story short, made a laparotomy with the advice and assistance of Dr. Pinkerton, of Salt Lake City, bringing to light a greatly enlarged club-shaped appendix, about becoming gangrenous. The patient, barring the formation of an abscess, made an uneventful recovery, and is still serving as a soldier.

I had but a short lull, when I was called to see the seventeen-year-old son of an officer, who was suffering from abdominal pain, fever and vomiting, the result of indiscretion in eating at a picnic. On inquiry I learned that he had had periodically similar attacks for seven years, and had been in ill health during most of the time; he presented an unhealthy emaciated appearance. The seat of pain was located by the patient above the umbilicus. Palpation revealed exquisite tenderness only over McBurney's point, and the sensation of a tumor, or at least of something that ought not to be there. Diagnosis was made of recurrent catarrhal appendicitis, and according to the teachings of Senn, recommendation was made to have the appendix removed, as soon as the active inflammation had subsided, if appearance of peritonitis did not compel early operation as a life-saving measure with, of course, less favorable prognosis. Divided doses of a saline mixture were given and the attack subsided. I then performed laparotomy in the usual manner, with the assistance of Drs. Meacham and Niles, of Salt Lake City, and delivered an

enormous club-shaped appendix. Recovery was uneventful, and patient steadily improved in general health.

This did not end the lessons I received on the subject. Mrs. S., the sister of an officer, came to my post as "a last resort" to try my skill. The diagnosis she brought with her after fourteen years of invalidism was that of "diabetes," which was soon negatived by analysis. Her appearance was haggard, anemic, with deep-drawn lines of suffering. She complained of a variety of ailments, none directly attributable to intestinal disease, and for quite a while I was at a loss how to explain debility, listlessness, and various nervous disorders. I treated her for an intercurrent attack of bowel complaint, which she said she had had before, and had been called by her physician "neuralgia of the stomach." I paid no particular attention to this attack, and continued my almost hopeless ministrations, when I was called some weeks afterwards to another "attack" of the "neuralgia of the stomach," and becoming suspicious, more carefully inquired into the history of the "attacks" and found that she had been suffering from them for fourteen years several times a year, generally in summer. Careful palpation revealed rigidity of the abdomen and great tenderness over McBurney's point. She had some rise in temperature. I then diagnosed recurrent catarrhal appendicitis and advised operation, which decision was hailed with great satisfaction. I made an uneventful laparotomy, and removed an enlarged thickened appendix, with a constriction in the outer third of the lumen, scarcely enough gross anatomical lesion to justify to my mind the risk of the operation. She made an uneventful recovery, and from the day of the operation expressed herself relieved of a distress, which she had never before entirely got rid of. She returned to her home greatly improved in flesh and appearance, a well woman. Six months have elapsed since the operation, and I hear that she is thinking of accompanying her husband to the Klondike, a valid proof of permanent recovery.

Some months after this, Sergeant William H. Franklin, Company E, 24th. Infantry, reported sick at the hospital with intestinal colic. He received a laxative and in a few days reported himself able to do duty. A few weeks afterwards he returned with the same symptoms, and stated that he had been so long in ill health, that he wished something positive could be

done for him and expressed himself willing to submit to any operation to get relief. He had, no doubt, in his mind the two previously mentioned cases. I had not been in search for more evidence for my beginning conversion and had not thought of appendicitis in his case. I then questioned him closely and found that since 1890 he had had periodical attacks of ill health, principally referable to the abdomen. He suffered after every meal, had continual desire to vomit and had reduced his diet to the blandest and most digestible food. He said he was afraid to eat anything, and had lost forty pounds in weight. A careful palpation of the abdomen revealed exquisite tenderness on deep pressure at McBurney's point. No other pathological symptoms could be discovered. I made the diagnosis of recurrent catarrhal appendicitis and advised operation, which was performed after the usual preparation. The appendix was found enlarged, without adhesions. While making the cuff, I accidentally nicked the appendix and a stream of intensely foul smelling gas struck me with perceptible force in the face, showing that the gas was under high pressure, and consequently the appendix constricted at the neck. The evening of the day of the operation patient stated that he had not felt so well since he was taken sick seven years ago, that something was removed which had caused a perpetual feeling of oppression. He made a successful recovery, and since has had a hearty appetite and excellent digestion, without the recurrence of a single unpleasant symptom. He has regained his usual weight.

A joking remark from one of the leading physicians in Salt Lake City, intimating, without actually saying it, that I was becoming a crank on appendicitis, almost made me lose my next case from a mistaken attempt to treat it without operation.

Private Edward R. Strange, Company H, 24th. Infantry, was in the hospital for some other ailment and suddenly complained of abdominal pain with constipation, alternating with loose discharges; temperature, 103.6°; desire to vomit, but inability to do so on account of the intense pain. Tenderness on pressure over the whole abdomen, but more intense and pronounced at McBurney's point. I diagnosed acute appendicitis, but determined to reduce the attack, if possible, by medicinal treatment and postpone operation to a free interval, if the disease

proved to be of a recurrent character. Divided doses of magnesium sulphate, and turpentine stupes seemed to afford relief, and the temperature fell somewhat, but on the third day rose again to 103° . The excessive pain then necessitated occasional doses of morphine, the temperature oscillating between 99.4° in the morning and 100.4° in the evening, and the case assumed such gravity that I determined on operating, in which my consultants, Drs. Kirkpatrick, Niles and Meacham, fully agreed.

On opening the abdominal cavity it was found filled with a clear serum, and all the intestines slightly agglutinated with recent adhesions. Rupture of the appendix and abscess were confidently looked for, but the organ was found only in an inflamed, enlarged condition, without more adhesions than those in the general peritoneal cavity. It was removed, the adhesions between the intestines liberated, the abdominal cavity irrigated with several gallons of hot normal salt solution, the surplus allowed to remain in the cavity. As a purulent peritonitis was confidently expected, the incision was only partly closed after introduction of a gauze drain enveloped in gutta-percha tissue into the pelvic cavity. The temperature rose to 100 for three evenings after the operation, and thereafter remained normal. The drain was removed after three days and its channel treated for a few days with peroxide of hydrogen. The wound closed without an untoward symptom.

This is a case where an attempt at conservative treatment nearly led to fatal consequences, as I firmly believe that in another twelve hours purulent peritonitis and subsequent death would have resulted.

During these months of transition in my views as to the necessity of operation in appendicitis, I saw a number of cases operated on in the Hospital of the Holy Cross, at Salt Lake City, by Drs. Niles, Richards, Meacham and others. They were in all stages of the disease—some so desperate as to make me believe an operation almost useless, and they all recovered; while I learned of several cases in Salt Lake City when, for mistaken diagnosis, fear of the knife, or apparently hopeless condition, owing to long delay, the operation was omitted and the patients invariably perished.

All this has made a profound impression on my mind, and I am now of the opinion that every fully diagnosed case of appen-

ditis should be operated on at the earliest practicable moment, irrespective of temperature, condition or age of the patient, and if symptoms are obscure, but we either have recurrent attacks of inflammatory action in the lower part of the intestines or an acute peritonitis which cannot be otherwise explained, a laparotomy should be made.

At most of my operations my assistant, Dr. Kirkpatrick, was present and rendered valuable aid.

I am particularly indebted, however, for valuable counsel and assistance to Drs. Meacham and Niles, and to the moral support and interest shown by Drs. Penrose, Root, McKenna, Whitney and others, as faithful, intelligent and painstaking a lot of physicians as it has been my good fortune to meet in a practice of over thirty years.

A few words as to the method of operating, which was identical in all cases, may be of interest. The line of incision was the usual one, slightly curved from McBurney's point downwards, pointing towards the symphysis, along the outer edge of the rectus. The skin incision was usually not more than $2\frac{1}{2}$ inches, and the opening in the peritoneum $1\frac{1}{2}$ inches. The muscular fibers were separated bluntly. After ligature of the mesentericolum (a double silk ligature having been passed through it at the origin of the appendix, one-half being used for the purpose, twisted to make a "lock-stitch") a peritoneal cuff was dissected off from the appendix, and this tied with the other half of the ligature, and cut off. The stump was treated with carbolic acid, the cuff sewed over it with fine silk. As a rule, no "toilet" was made and the wound united without drainage, by interrupted sutures of silkworm gut passed through all the tissues, including skin and peritoneum. I was rather in favor of separate buried sutures for each layer, believing that the normal anatomical relations would in that manner be more accurately restored, but I yielded to the counsel of Drs. Meacham and Niles, who feared infection by sutures which are out of sight and by the above method had obtained such remarkable results. The small size of the incisions no doubt contributed to firm union.

This rather clinico-historical paper being completed I sought for competent authority among the latest publications on appendicitis in support of my experience during the last year, and the views resulting from it and advanced herein. The monographs

of Fowler, Deaver and Morris published respectively in 1894, '95 and '96, are the only late works treating on the subject specially known to me, and short extracts as to the necessity and time of the operation are herewith submitted.

Fowler says, in his monograph of 1894, as follows: "In my judgment, the only cases treated non-operatively in which the prognosis can be said to be favorable, are those in which the disease is neither progressive nor stationary, but, on the contrary, is retrogressive within the first twenty-four hours after the attack, as evinced by the symptoms of tenderness, providing this latter has not been masked by the administration of opium or some of its derivatives. If on one hand, these indications are fulfilled, the attendant may encourage the patient that he will recover without operation; but, on the other hand, both will lean upon a broken reed, if reliance is placed upon any or all of the other symptoms. To sum up the whole matter, therefore, the prognosis, in cases in which no operative interference is instituted, is always uncertain, particularly so in cases in which the first symptoms subside and recur, as well as in cases which are subacute from their commencement."

I am willing to agree with Fowler as to waiting twenty-four hours to determine if the case is progressive or retrogressive, if it came at its onset under competent observation, unless urgent symptoms appear at once. If the patient has been suffering for several days before applying for assistance, the case should be considered a progressive one and operated on at once.

John B. Deaver, of Philadelphia, says in 1895: "In the treatment of appendicitis my observation forced me to the conclusion that there is but one course to pursue in order to obtain the best possible results; viz., to remove the appendix as soon as the diagnosis has been made. The appendix should be removed so early in the attack that there will be no danger of septic absorption, purulent peritonitis, or perforation supervening, and in those cases of a fulminating character, which have been almost instantaneous in their progress from the initial symptoms to the inauguration of a purulent peritonitis from perforation or gangrene, early operation is positively demanded."

And in another place: "I recognize the fact that a very small percentage of all cases will temporarily recover without

the use of the knife, but no one can tell which case will terminate favorably or which will grow to perforation and gangrene, with the train of fatal complications that is liable to follow. The best result in all cases is obtained by removal of the appendix in the beginning of the attack. Appendicitis is a surgical affection, and should be treated as such."

And in another place: "To defer operation a certain number of days or even hours is to expose the patient to risks not justifiable in the light of the present status of appendiceal surgery. The best results and the smallest mortality are obtained, when the operation is performed at the earliest possible opportunity. The diagnosis can and should be made in a few minutes, and the operation should follow as soon as possible."

Robert T. Morris, of New York, says in 1896: "Five years ago a small proportion of appendicitis patients were operated upon before they had reached the life-or-death stage of septic intoxication. With other surgeons, I have tried to do my part in taking appendicitis cases out of the life-or-death class, and placing the operation where it belongs,—in the field of preventive medicine,—not preventive in the sense of removal of the normal appendix for the purpose of avoiding the recurrence of appendicitis, but rather in the meaning of isolation of an infected appendix, before it has infected other structures."

J. B. Murphy: "The question of the greatest practical importance to the surgeon and physician is the diagnosis; can we determine when an appendicitis is present, and can we determine the pathological conditions that exist in the abdomen at any given time in the progress of the disease? To the former we must with positiveness answer in the affirmative; to the latter an equally forcible negative must be given; that is, we can say from the symptoms that a lesion of the appendix exists, but we cannot say, in most cases, how extensive, how dangerous and how far reaching the effects of that appendicitis may be, and still less can we say in any given case how soon the life of the patient may be greatly jeopardized by the disease which at the moment has apparently no grave symptoms.

"If we were able to determine in the early stage from the symptoms, physical signs or clinical history of a given case that it was going to take a favorable course, we could regulate our

treatment accordingly. Unfortunately, there are no symptoms present in the dangerous cases, premonitory of their fatal termination, until the patient has passed the stage where an operation offers reasonable hope for a recovery. The question to be answered is, when should we operate? The so-called conservative answers 'operate on the collapsed cases; the cases that present symptoms of fulminating peritonitis; the cases that appear to be progressing rapidly to destruction under medical treatment.' The surgeon must take a positive stand and answer, 'no,' to each of these rules. It is admitted that 50 per cent. of the fatal cases terminate before the end of the sixth day, many on the fourth, and a smaller number on the second. We have no sign, symptom or combination of signs and symptoms which indicate with any degree of certainty, suppurative peritonitis."

After the completion of this paper, my faith in the principles, which I have advocated, was put to a test by the occurrence of a case of appendicitis without vomiting and without temperature, but with rigidity of the abdominal wall over the right hypogastric region, while the left one was flaccid, and the intense tenderness on pressure over McBurney's point.

Private James G. McPherson, Company G, 24th. Infantry, reported sick on January 25, 1898, with pain in right side of abdomen, which had lasted one week. The bowels were inclined to be constipated. No temperature, no vomiting. Complaints of irritability of the bladder and difficulty to hold his water any length of time. Never had any venereal disease. I find in my notes of that day "a rigidity of abdominal wall on the right side. Tenderness on pressure at McBurney's point. Probable inflammation of appendix." He was ordered to be put to bed on light diet and ordered magnesium sulph. 1 drachm every hour, unless the bowels moved during that time.

January 26th. Feels better, less pain. Tenderness continues.

January 27th. About the same; temperature 98.4 in the evening. Pain still present.

January 28th. Temperature normal. The pain was worse and is steadily increasing. No vomiting. Bowels freely open. Pain on deep inspiration. Countenance anxious. Tenderness on pressure increased.

The condition evidently being progressive, I determined on operation, and Dr. Kirkpatrick of the Army and Dr. Niles of Salt Lake City, whom I telephoned for, agreed with me. I made at once preparation for operation. The incision was made on the outer edge of the rectus, and by proceeding slowly I caught every vessel before division with forceps, and the operation was almost bloodless. On the abdominal cavity being opened a slight effusion of serum appeared. The appendix was easily delivered, and on external inspection was found greatly distended with a marked constriction at the junction of middle and outer thirds. It was removed in the usual way, except that finding great difficulty in preparing the cuff owing to the attenuation of the peritoneal covering due to the enormous distention and the alarming condition of the patient, who had ceased to breathe, and had become pulseless, I abandoned the completion of the cuff, and while artificial respiration and other means were resorted to to bring the patient to life again, I ligated off the mesenterium and appendix and removed the latter. The stump was treated with carbolic acid (the bulging mucosa having been excised) and covered with the peritoneal covering by means of a continuous silk suture.

The abdominal wall was united with the usual silkworm gut suture. The incision in the peritoneum was about two inches. Long before completion of the operation the patient had been restored—the sudden depression having evidently been due to nausea.

A slight rise of temperature took place on the first and second days (surgical fever), and dropped to normal on the third. On the fifth day the temperature rose to 100.5° , indicating pus. The dressing was removed and an accumulation of pus was found in the lower angle of the wound where the tightness of a ligature had caused some necrosis of the tissues. The ligature was removed, the abscess irrigated with peroxide, and the temperature immediately fell. On the seventh day a slight rise to 99.8° , led to investigation which showed that the pus had dried on the dressing and thus prevented escape. As soon as this was remedied, the temperature became normal and remained so. The stitches were removed on the eighth day, and with the exception of a small opening in the lower angle of the wound, it was found

united by first intention. From the small pus sac scarcely enough discharge took place to soil the dressing. On the ninth day patient declared himself as well as ever.

The condition of the appendix in this case clearly proves that the operation was necessary, although the clinical history showed only a mild attack of appendicitis, which under conservative treatment should subside. The progressive nature of the attack, in spite of the most approved methods of treatment, clearly foretold the eventful outcome, and I deemed it my duty not to wait for life-threatening complications before resorting to operation. The removal of a diseased appendix presents no formidable interference with the economy of the system and need not be classed higher than ablation of the tonsils, unless we wait for complications, when the operation becomes formidable. The loss of the time incurred by operation is surely not greater than would be with conservative treatment and absolute safety to the patient may be looked for.

An analysis of these cases, especially with the view of determining the necessity of operation is now in order.

In case one, the Corporal of the 16th., we had no doubt one of the cases of appendicitis, where in a few hours gangrene would have set in, necessitating a life-saving operation under unfavorable prognosis, if the right moment had been allowed to pass.

In case two, the son of the officer, the history of recurrent appendicitis was plain, and the condition of the appendix after removal proved that almost any new attack would be followed by either perforation or infection with consequent peritonitis. Seven years of ill-health were terminated by the operation.

In case three, the sister of the officer, the diagnosis was clear, that the appendix, although apparently not indicating immediate mischief, was the cause of fourteen years of invalidism, is proven by the recovery of general health after its removal.

In case four, that of Sergeant Franklin, we had seven years of ill-health, not benefitted by the most careful mode of living, immediately terminated by removal of the appendix. The organ was not in the condition which the opponents of operation would demand before acting surgically, and still conservative treatment appeared of no avail.

In case five, that of Private Strange, appendicitis was acute, was immediately recognized and conservative measures attempted and kept up until general peritonitis set in, when the operation was performed, really a life-saving measure, but fortunately just before formation of abscess.

In case six, the diagnosis of appendicitis was made early in the case. The symptoms were mild but progressive. The removed appendix was proof positive that either infection of the neighboring peritoneum or perforation would in a few days have made an operation of questionable result, while this early operation was followed practically by no reaction and led to speedy recovery.

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XX. WOMEN NURSES IN THE AMERICAN ARMY.

By ANITA NEWCOMB McGEE,

ACTING ASSISTANT SURGEON, U. S. ARMY.

IN the days of peace, between the Civil and the Spanish wars, nursing in the Army was done entirely by men. At the end of March, 1898, there was a body of 520 Hospital Corps men in all degrees of training as nurses for Army work, as well as 100 Hospital Stewards and 103 Acting Stewards, who may be considered the equivalents of graduate nurses from civil hospitals. This number, barely adequate for an army of 25,000 men in time of peace, was, of course, wholly inadequate in time of war for an army of ten times that size, and although it was planned to greatly increase the Hospital Corps, it was evident that such raw material could not do the work of trained nurses. Therefore, to supply the approaching necessities of the army, the United States Congress, in April, 1898, at the request of the Surgeon General, authorized him to employ nurses under contract and made an appropriation for their payment. No restriction was made as to sex, but at that time it was the opinion of the War Department that but few women nurses would be needed and that their services would be limited to the general hospitals. Several hundred women, mostly untrained, had already applied, but the force of the Surgeon General's office was too limited to permit of any examination of their qualifications.

Knowing these facts, the writer suggested to the National Society of the Daughters of the American Revolution (of which she was a Vice President General) that that organization should act as an examining board for women nurses for the Government. The Surgeon Generals of both Army and Navy promptly accepted this offer of the "Daughters," and in April the "D. A. R. Hospital Corps" was organized, with the writer as Director.

The standard adopted for appointment to Army service was that of graduation from a training school, combined with suitable endorsements, the chief reliance being placed on a recommendation of the superintendent of nurses under whom the applicant had graduated. Women physicians were also considered eligible.

The first nurses were appointed on the 10th. of May, and ordered to the General Hospital at Key West, and before the 15th. of July, 47 had been asked for by surgeons at different General Hospitals and had been selected by the "Daughters" for appointment by the Surgeon General. About this time the yellow fever appeared among the Santiago troops, and nurses were urgently needed there. The Surgeon General, therefore, employed the wife of the Superintendent of a Washington hospital, and sent her to New Orleans to procure the services of immunes, both male and female. The majority of the nurses so appointed were colored women without hospital training, a considerable number of whom were sent to Santiago in July and August. The "Daughters" also supplied a few trained immune nurses for this service.

During the month of August an epidemic of typhoid broke out in the camps which had been established as places of instruction for the Volunteer troops. It also became evident at that time that these camp hospitals had lost their original character and become practically stationary, and consequently the objection to the employment of women nurses in them had disappeared. During that month, therefore, and especially in its latter half, the demand for nurses grew to an entirely unexpected degree, and the roll of army nurses reached about 1,000 names. Not only did they go to General and Field Hospitals, but whenever the Surgeon in Charge of a Division or Post Hospital so requested, trained nurses were assigned to duty under him. During the Fall it became not uncommon for regiments or larger divisions of troops, when they moved to Southern camps or Cuba, to take with them the trained nurses attached to their hospitals, and no inconvenience or difficulty has been reported as ensuing.

It is needless to refer to the great value of the work rendered by these trained assistants to the Medical Department of the Army, since surgeons, patients and the public at large have been most enthusiastic in their expressions of appreciation. Scarcely a training school in the United States but sent some of its best representatives for this work, and the women adapted themselves to camp conditions and to many sorts of discomfort in a manner that quite altered the many preconceived opinions.

During the greatest stress of the work, valuable assistance in securing the services of nurses was rendered to the Govern-

ment through the "Daughters," by a number of organizations. The Sisters of Charity merit prominent mention in this connection, as they furnished from their order 200 Sisters, many of whom had much hospital experience. A few of the Sisters from four other Catholic organizations and one Protestant Episcopal Sisterhood also served for a time. The Society for the Maintenance of Trained Nurses, which was Auxiliary No. 3 to the American National Red Cross Relief Committee of New York, in August, and for a few months thereafter, examined the credentials of a large number of applicants and was unique in its work of furnishing money for the transportation of nurses and for their comfort while waiting orders in New York City and while serving at certain Army hospitals. Much valuable aid was rendered by the superintendents of training schools, although it is an interesting fact that no organization of trained nurses has rendered any noteworthy assistance. In spite of the overcrowding which had previously been complained of in the nursing profession there was much difficulty at the time of greatest stress and need in securing enough suitable applicants to fill the demands from the camps. The Chief Surgeons at Montauk, Jacksonville, Lexington and San Francisco were therefore authorized to secure women nurses without regard to training, and in this way a few undesirable appointees unavoidably crept in.

In addition to the Army Nurses, temporary help was accepted at a few hospitals from women who were not connected with the Medical Department. That such should be the case is much to be regretted, as irregular nurses are not subject to control and discipline and do not hold the same honorable position as do women who have Governmental authority for their presence with the army. However, the zeal of womankind is such that some exceptions of this kind were almost inevitable.

The volunteer work of the Daughters of the American Revolution and of the societies which were co-operating with them, was necessarily limited to the selection of nurses for appointment. By the end of August, 1898, it became necessary to establish an Army Nurse Corps Division of the Surgeon-General's Office, and the writer was therefore appointed an Acting Assistant Surgeon and assigned to duty in charge of that Division.

After the middle of September, at which time about 1,200 nurses were in service, there was a gradual decrease resulting from the control of the typhoid fever, and later from the mustering-out of the Volunteer Army. At the close of 1898 there were 686 women nurses in service, and on the 1st. of July, 1899, there were 202, which number has not greatly varied up to the present time. They are stationed at General, Field and Post hospitals and camps in the United States, Porto Rico, Cuba, Honolulu and the Philippine Islands and on the Hospital ship "Relief." The total number of women who served as Army Nurses prior to July 1, 1899, was 1,563, and the number of applications at that date had almost reached 6,000.

The fatality among the trained nurses has been extremely small, the deaths numbering only five. Five of the 250 Catholic Sisters also died, as did three out of about 100 untrained (immune) nurses. All except two deaths were from typhoid fever.

The work of 1899 has been to organize the "Army Nurse Corps" and to perfect the nursing records of the war. The applicants for appointment include large numbers of nurses who have, in previous service, become familiar with army duties, and these applications are a most encouraging indication of the success of the work.

The organization of the Corps is still incomplete in some details, but a satisfactory basis for its general regulation has been evolved from experience. The rules governing this matter were issued from the Surgeon-General's Office on June 20th. last, and bore the approval of the Secretary of War. They provide as follows regarding the qualifications for appointment:

To be appointed in the army a nurse must be qualified therefor, physically, mentally, and morally, as hereinafter provided:

1. She must present a physician's certificate of health on a blank form which will be furnished by the Surgeon General.

2. She must be a graduate from a training school for nurses which gives a thorough professional education, both theoretical and practical, and requires at least two years' residence in a hospital.

3. She must be endorsed by the present superintendent of nurses at the hospital from which she graduated and also by the one under whom she was trained. Blanks for these endorsements

will be furnished by the Surgeon General and are to be returned directly to him.

This circular also states that :

Women not under army contract will not be permitted to serve as nurses in Army hospitals unless in an unforeseen emergency, and in such case the medical officer in charge of the hospital will immediately report the fact to the Surgeon-General for his action.

On entering the service the nurse signs a contract to serve for at least one year, unless she should sooner be discharged, and she receives for service in the United States, \$40.00 a month ; for service outside the States, \$50.00. Besides this, each nurse receives quarters and rations, as well as all transportation expenses to and from her home, and when traveling under orders ; and is further entitled to 30 days' leave of absence with pay, for each year of service. She is also cared for during illness. This compensation as compared with that given to graduate nurses in civil hospitals is very fair, and quite satisfactory to the nurses themselves. A uniform and badge have lately been prescribed for the army nurses.

In Cuba, during the past summer, a number of trained nurses have been called upon to care for yellow fever patients, and in some instances have contracted the disease themselves, though fortunately no fatalities have ensued. At hospitals especially provided for yellow fever patients, only immunes to that disease are stationed, and it is often necessary to appoint women for this purpose who are not graduates of training schools. Such appointments, however, are considered temporary.

At each hospital, a nurse of executive ability and tact is appointed by the Surgeon-General as Chief Nurse, her duties being, so far as army conditions permit, equivalent to those of a Superintendent of Nurses in a civil hospital. The Surgeon in Charge of each hospital reports changes in status and number of nurses, but the Chief Nurse herself reports on their efficiency, health and conduct. These reports are sent to the Surgeon-General through the Surgeon in Charge of the hospital, who is directed to make his own remarks thereon. The provision for Chief Nurses has been found of the utmost importance to the success of the Corps, and, as the duties of the women holding this position are often diffi-

cult, they have increased salary in proportion to their responsibilities. At small hospitals, where there are not over four nurses, the Chief Nurse is expected to do her share of ward duty, and receives no increase in salary.

At many Army hospitals, the nurses, or expert women who are appointed especially for the purpose, have been utilized as dietists, and have had charge of the cooking for patients. This plan has proved most satisfactory in its results. In August, 1899, a new departure was inaugurated at the school for Hospital Corps men at the Washington Barracks, Washington, D. C. One of the nurses, who had been a dietist at 7th. Army Corps Hospital, Jacksonville, was assigned to duty as instructor in diet for the sick, and she is now engaged in teaching large classes of newly enlisted Hospital Corps men how they should prepare water, milk, gruels, jellies, etc., and also how elements of the Army ration can be prepared so as to be suitable for the sick, when nothing else is obtainable. Fifteen lessons are given, of an hour each, and the result of this work, when these Corps men are scattered through the camps in the Philippine Islands, will be noted with much interest. So much have they appeared to be interested in, and to profit by the lessons at the Washington Barracks, that the new school for Hospital Corps men near San Francisco, has also a woman nurse as instructor in diet cooking.

Perhaps one of the most important features provided for in the present organization of the Nurse Corps is the body of reserve nurses, which consists of women who have served in the Army at least four months, and whose record has been thoroughly satisfactory in every respect. They are to be transferred to the active list when their services are needed, especially in time of war, and the list will practically be a roll of honor. The reserves wear the badge of the Army nurses, but are not paid except when on active duty.

In Europe, as a general rule, a limited number of women nurses is employed in Army hospitals in time of peace, and provision is made through religious and secular channels, for a large increase in case of war. In our country the religious sisterhoods have but a small surplus beyond their own needs. The Red Cross Societies of foreign countries are great organizations under Government control, through which all aid to the Army

must come, but we have nothing similar to them in the United States, nor are they indeed altogether compatible with the liberal instincts of our people. It follows that the only satisfactory method of dealing with this question here, so long as the nursing profession is in feminine hands, is by the organization of a regular Army Nurse Corps of women, with both active and reserve lists. It is surely not an exaggeration to say that the establishment of this Corps, under the Surgeon-General, is one of the noteworthy results of the Spanish War.

XXI. WIRING OF FRACTURED PATELLA.

By CAPT. GEORGE WORTH WOODS,

MEDICAL DIRECTOR, U. S. NAVY.

IN cases of fractured patella, which is as common to the Army as to the Navy, my usual procedure has been in my earlier practice to employ the somewhat barbarous "Malgaigne Hooks" and later the splint of Agnew, with the separated fragments drawn together by means of adhesive plaster, or in comparatively slight separation of fragments, the elevated position for limb, and a "Plaster of Paris Dressing." The result has never been entirely satisfactory, as only fibrous union has been obtained, and for this reason I beg leave to present the brief history of a case in which the separated fragments of the patella were wired; use being made of Fluhrer's Crochet Drill, carefully annealed wire, and other appliances for the operation, as figured in the catalogue of George Tiemann and Co., New York City, pages 621 and 622, with a most happy result of bony union.

McMahon, F. R.—Ordinary seaman, aet. 29 years.

While engaged in a general fight on shore at Kingston, Jamaica, March 27, 1899, a large stone was hurled at him, striking him on the right knee, fracturing his patella, transversely.

The upper fragment was small. He was treated by a posterior splint and counter-pressure bandages, and recovered with about three-fourths of an inch separation between the fragments; union, fibrous.

On September 5th., while on liberty, he fell and broke up the union. There was considerable effusion into the joint.

On September 13th., under ether anesthesia, the joint was opened by a transverse incision, the torn capsule being freely incised. Clots were turned out of the joint, the bone surfaces were freshened with rongeur forceps and a sharp spoon.

A heavy silver wire was passed through each fragment by means of Fluhrer's Crochet Drills and the fragments brought together.

A drainage tube entered the joint on the outer side. The divided tissues were united with two layers of catgut, with retaining sutures of silk superficially placed.

Post-operative condition normal. Primary union followed. The tube was removed on the fourth day.

It is proposed to begin passive motion on the fourteenth day. The result should be perfect.

XXII. CONSERVATISM IN MILITARY SURGERY.

BY CAPTAIN W. C. BORDEN,

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IN regard to the treatment of gunshot wounds one fact has been clearly proved by experience in the Spanish-American War, and that is that conservatism must have the largest place in future military surgery.

Overlooking the work and success of Von Bergmann and others in treating gunshot wounds by conservative methods, and arguing from the statistics and premises of pre-antiseptic days and from the brilliant results of radical surgical interference during time of peace in well appointed civil hospitals, many surgeons were led to believe that active surgical measures could be adopted with success in field hospitals, and some even went so far as to suppose that extensive operations could be successfully performed almost on the firing line. But the facts of war have demonstrated that active interference immediately after the receipt of gunshot wounds is but rarely required and that when surgical operations are demanded they may usually be deferred until the wounded reach a general hospital, where technic and appliances similar to those of civil hospitals are available.

It is surprising how long operations may be delayed, even in the case of infected wounds, if the wound is kept reasonably clean with antiseptic dressings. This furthers conservatism, for it does away with the necessity for immediate operation, and allows the wounded to be transported to permanent hospitals, where the wounds may be examined and treated under aseptic and antiseptic technic.

The following cases which came under my care are illustrative:

Private G—— M——, U. S. Marine Corps, was wounded while serving on the U. S. S. "New York," at the bombardment of San Juan, Porto Rico, May 12th., by a fragment of shell which

struck the back of the elbow, carried away most of the soft parts over the back of the joint and fractured the humerus and ulna.

In spite of the large lacerated wound, the ship surgeon thought that the limb might possibly be saved, and rightly determined to treat the wound antiseptically and have the man taken to a general hospital for final decision. In consequence, the patient was transferred to the Naval Hospital Ship "Solace," on which he was brought to the General Hospital, Key West, Florida, arriving there on the evening of May 20th. On admission the patient's temperature and pulse were slightly above normal and his general condition good.

On the evening of the 21st., he was given an anesthetic and the wound thoroughly examined with a view to conservatism, if possible, and amputation if necessary. It was found that some fragments of bone had been removed or had been carried away by the shell, that both condyles of the humerus were broken from the shaft, the fracture extending two and one-half inches from the lower extremity of the bone and that the ulna was broken into numerous fragments for four and one-half inches of its proximal extremity. The radius was not broken, but the orbicular ligament was completely torn in two and the upper end of the bone was lying exposed in the wound. The wound was suppurating moderately, but in excellent condition, due to its having been cleansed and packed with iodoform gauze. The septic condition of the wound, the extensive laceration of the soft parts and the loss of tissue together with the extensive shattering of the humerus and ulna, which would have necessitated the removal of fully three inches of the former and four and one-half inches of the latter bone, negated conservatism and indicated amputation. The wound and surrounding parts were thoroughly cleansed with soap, water, alcohol, peroxide of hydrogen and sterile salt solution and a circular amputation was done in the lower third of the arm, the humerus being sawed through three and one-half inches above its lower extremity. In spite of the close proximity of the amputation to the suppurating wound, and though amputation was done nine days after the receipt of the wound, union was by first intention, the patient was up and walking about the hospital yard eight days after the operation, and on the ninth left for the North.

The following case, in which conservatism was tried for 39 days, though the femur was badly shattered and the wound infected, still further illustrates the non-necessity for hasty interference.

Corporal G—— P——, 24th. Infantry, was wounded July 1st., by two bullets, which lodged in the right thigh and fractured the bone in the lower third. He was transferred on the "Relief" from Santiago to Long Island College Hospital, Brooklyn, N. Y. Suppuration had occurred, a sinus persisted and on August 2d., an incision was made over the seat of fracture, the wound thoroughly cleaned and some fragments of bone and a small piece of lead removed. Suppuration continued, and as the patient's general condition was unfavorable, the limb was amputated in the middle third, August 9th., 39 days after the receipt of the wound, and a good recovery resulted.

In both of these cases an original amputation would have been indicated, but they are given to show that even with infected wounds, under proper antiseptic treatment, delay until the chances for conservatism are exhausted, is not extremely dangerous.

Much less is there danger when the wounds are aseptic, as are the majority of wounds made by the small calibre or other bullets, for asepticity of the wound is not a condition exclusively belonging to wounds made by the jacketed bullet. The slow moving lead bullet frequently produces aseptic wounds which cannot be told from those made by the swift-moving jacketed projectiles.

The Shrapnel bullet is a large calibre, round, soft lead ball, moving with low velocity, yet in several cases which came under my observation during the late war, the wound of entrance made by the Shrapnel was so small and so clean that it was thought to have been made by the small calibre bullet until Roentgen ray examination disclosed the true nature of the missile. The following are illustrative cases:

Private G—— A—— H——, Company E, 13th. U. S. Infantry, was wounded July 1st. by a Shrapnel ball which entered the back of the neck one-half inch to the left of the second cervical spine.

When admitted to hospital, the wound of entrance was small and nearly healed, there was nothing in its appearance to indicate

that it had been made by a missile larger than a Mauser bullet, and the patient himself thought he had been wounded by a small calibre bullet.

The fluoroscope, however, demonstrated that it was a Shrapnel ball, and it was removed July 16th. from beneath the anterior edge of the sterno-mastoid muscle two inches below the lower end of the mastoid process. Though made by a Shrapnel, the wound track was not infected; the wound of operation healed by first intention and the patient was well when furloughed, August 6th.

Private H—— E—— C——, Company E, 9th. U. S. Infantry, was wounded in the left shoulder July 1st. The bullet entered one inch above the clavicle, at the junction of the outer and middle thirds, and fluoroscopic examination failed to locate it. The fluoroscope in this and several other cases failed at Key West, through lack of penetration of the thicker parts of the body. On his admission to the hospital the wound was small and aseptic, healed quickly and from its appearance was thought to have been made by a small calibre bullet. He complained of pain in the region of the shoulder blade, but had no other symptoms. He was furloughed August 5th., but upon rejoining his regiment at the expiration of his furlough he found it difficult to handle a gun, and was sent to the General Hospital, Washington Barracks, D. C., where he again fell under my care. The bullet was now located just beneath the posterior border of the scapula, and the radiograph showed it to be a Shrapnel. I removed it December 3d., 1898; the wound healed by first intention and the patient returned to duty six days later. The original wound, though made by a Shrapnel, was entirely aseptic. At the operation the tissues about the bullet wound showed no evidence of inflammation, and it was producing trouble only through friction in movements of the shoulder.

It was by virtue of this aseptic property of bullet wounds and the ability of the tissues to overcome the slight infection arising from small wounds, that Von Bergmann, the apostle of conservatism in military surgery, obtained his brilliant results in the Russo-Turkish War.

By the use of occlusive dressings, antiseptic precautions and immobilization of the limb, he saved thirteen out of fourteen cases of severe gunshot wound of the knee joint, complicated with ex-

tensive comminution of the bone, while of other similar cases treated by the old method of exploration without antiseptic precaution, 95 per cent. died.

Previous to the experience gained in this war the method of treatment of gunshot wounds of the abdomen as received in war was not definitely settled.

The brilliant results arising from prompt operative interference in this class of wounds in civil practice led many surgeons to the conclusion that similar treatment should be adopted in war. These theorists did not consider the practically insurmountable difficulties in the way of obtaining asepsis under the conditions present in field hospitals in time of war, neither did they appreciate the press of work in such hospitals when crowded with wounded during the progress of an engagement, or the time consumed in such operations, time which cannot be spared for such operations when others of equal urgency and more promise of life-saving are pressing. But the experience of the late war, where 50 per cent. of all cases of abdominal wounds unoperated recovered, while all operated died, has shown the inadvisability, under ordinary circumstances, of doing laparotomy for gunshot wounds in war. The conditions are so different from those in civil practice that a practically opposite rule must be laid down for each, and conservatism must rule in the war cases.

In fact, it may now be laid down as a rule that laparotomy in the field hospitals should only be done when death without operation is *absolutely certain*, and where the time devoted to operation upon a case is not taken from other cases which may in any way be injured by the delay. The first care of the military surgeon during the press of work incident to battle should be for those for whom there is probability of saving life rather than for those for whom there is only a nebulous possibility.

Actuated as he must be in future wars by the incentive to life- and limb-saving through the possibilities now given by aseptic and antiseptic treatment, the surgeon at the front should restrict operative interference to those cases where operation is imperatively necessitated to save life, or where the conditions of transportation are such that transportation without operation will endanger life. Equally, the executive medical officer will bend every energy to perfecting means for the rapid and safe transportation

of the wounded to permanent base or general hospitals that the wounded may there have the benefit of treatment under the perfect asepsis and antisepsis which modern conservative military surgery demands.

Fortunately, these ideas were extensively carried out in the late war.

The first-aid packet was almost universally used, and surgeons in the field, as a rule, refrained from operative measures, except when such measures were imperatively demanded.

The result has been most brilliant, for the death-rate of the wounded is lower than that of any previous war known to military history, and this despite the adverse conditions of climate and circumstances incident to invasion of a foreign country.

The following table, compiled from Lücke, and from data obtained from the Report of the Adjutant General and from the office of the Surgeon General of the Army, gives the proportion in different modern wars :

	Nationality.	War.	Wounded.	Died of Wounds.	To 100 of the wounded	
					Died.	Recovered
1	English.....	Crimean War	12,102	1,841	15.2	84.8
2	French.....	Crimean War	37,835	9,971	25.0	75.0
3	French.	Italian War ..	17,043	2,958	17.3	82.7
4	Federal troops..	Civil War	235,583	33,653	14.2	85.8
5	Germans.....	Danish War..	2,020	315	15.6	84.7
6	Germans.....	Austrian War	13,727	1,449	10.5	89.5
7	Germans.....	Franco-German War	99,631	10,981	11.0	89.0
8	Japanese.....	Chinese War.	3,009	230	7.6	92.4
9	Americans...	Spanish-American	1,577	78	4.9	95.1

The low percentage of 4.9 of death of the wounded and the high number of recoveries, 95.1 per cent. in the late war, speak volumes for the method of treatment employed and for the means adopted by the executive branches of the Medical Department for supplying necessary means for treatment. It demonstrates that the military surgery of the war made that advance in life-saving which is in accord with similar advances in civil surgery. Equally, a review of the means which brought these results about, shows that they were obtained mainly by conservative methods supplemented by executive action in establishing fully equipped

general hospitals and providing prompt and safe transportation of the wounded from the seat of operations to these hospitals.

But in closing this paper it should be emphasized that conservative military surgery does not necessarily mean non-interference.

True conservatism means the conservation of the life or limb of the patient, and this end is best obtained by *active* or *passive* conservatism, as the occasion may demand.

It means that experience has demonstrated that, *as a rule*, gunshot wounds should not be interfered with except under aseptic conditions, but that under those conditions they may be fearlessly dealt with when necessary. The military surgeon should not interfere when not sure of asepsis, unless it be to save life, else he may endanger life or limb or retard recovery, while with asepsis at his command, he will fearlessly intervene when the case demands it.

Following this, the surgeon at the front will dress wounds and immobilize wounded limbs, but will not operate except in extreme cases, while the surgeon at base and general hospitals, with the resources of asepsis and antisepsis, will operate fearlessly when necessary but not needlessly.

Following this, military surgery demands :

1st. At the front, the immediate application of the first-aid packet or other occlusive dressing to prevent further infection of the wound from the exterior. 2d. At the field hospital, the examination of such cases as demand immediate attention, the disinfection of the neighborhood of the wound and the application of aseptic or antiseptic dressings to such cases as need it, the immobilization of wounded limbs and the performance of absolutely necessary operations. 3d. The speedy and safe transportation of the wounded to base and general hospitals. 4th. At base and general hospitals, operative interference, if necessary, under proper aseptic precautions.

XXIII. SOME SUGGESTIONS FOR THE ORGANIZATION AND INTERIOR ECONOMY OF A STATE MEDICAL-MILITARY SUB-DEPOT IN WAR TIME.

By JOHN VAN RENSSELAER HOFF,
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“HISTORY is philosophy teaching by example,” we have but to review it, and then glance about us at the current happenings to be convinced that, in spite of our boasted civilization, man is instinctively a fighting animal, and war is always a probability.

While civilization has not and never will eradicate this instinct, it has so advanced our knowledge of *things* that war is no longer a mere question of the man—though this is the largest factor—but of the material, of the organization, indeed, of the numberless inanimata which make a part of the art of war. These are not the creation of a moment, but follow careful preparation and accumulation, the results of experience, study and opportunity.

We of the sanitary department have no small share in this work—indeed, it is an ever increasing share—for civilization, while unable to subdue the fighting instinct, demands that the fallen shall be more and more carefully conserved; therefore it is important that our preparation *ab initio* be carefully weighed and our plans determined upon before the event of hostilities.

In this connection we may well consider what will fall to the military authorities of the states, and our historical example will be drawn from the War of Secession.

During the years 1861-65, the total strength of the armies of the United States was 2,143,855,¹ recruited by the states as follows, viz.:

Maine.....	49,635	West Va.....	27,518	Iowa.....	68,118
N. Hampshire.	29,150	Ohio.....	225,669	Minn.....	18,554
Vermont.....	26,355	Kentucky....	43,550	California	15,725
Mass.....	98,803	Indiana.....	150,177	Oregon...	1,773
Rhode Island..	13,688	Illinois.....	210,048	D. of Col..	6,546
Conn.....	45,181	Michigan....	76,218	Colorado..	3,697
New York.....	334,784	Wisconsin....	73,865	Nevada....	1,080
New Jersey...	44,398	N. Mexico....	4,432	Dakota...	206
Penna.....	214,427	Missouri.....	78,035	Washing'n	964
Delaware.....	7,888	Kansas.....	16,624	Tennessee.	26,394
Maryland.....	24,954	Nebraska....	2,175	Etc., etc...	Etc.

¹ Fox says that, reduced to a basis of a three-year term, the total strength of our army was 2,327,917.

Of this number, at least 6 per centum² was engaged in the sanitary work of the armies in the field.

In other words, 128,631 medical and other officers and enlisted soldiers were on duty in the Medical Department between the fighting line and the hospitals at the base of operations. This number is exclusive of the personnel of the various military general hospitals scattered throughout the country far away from the theatre of operations, and differing very little from general hospitals in civil life. These hospitals contained in 1864, 318,000 beds, and their personnel numbered 31,860 officers and men.

For the purposes of this paper we have to consider only so much of the sanitary personnel as may be called "Military," viz., that part which is in immediate contact with the combatant forces in actual service; the part which during the war, 1861-65, was mostly detailed from the combatant ranks, in numbers which will never be known, and which probably represented a considerable portion of the 40 per centum difference between the paper and fighting strength of our armies.

In any future war we may have, it is hardly to be presumed or desired, that the requirements in men, of the medical department, will be met by depleting the fighting line; so it is reasonable to assume that our department will be called upon to recruit and train its own personnel, and this of course will be done, in large measure, through the medical departments of the respective states.

If this is to be the case, and if the requirements of our last war are an index of future wars, as to the number of sanitary recruits to be organized and instructed, it goes without saying that there must be some place where such preliminary organization can be made and such instructions given. This place I propose to call the State Medical-Military Sub-Depot.

To meet the requirements of active service, each state will necessarily have a place of arms where recruits can be rendezvoused, outfitted and drilled; where the required material can be gotten together; where companies and regiments can be organized; and where, finally, the state recruit, after being duly "mustered-in," will become a soldier of the United States.

² See articles on Sanitary Organization by the writer published in the various proceedings of the Association of Military Surgeons of the U. S.

It need hardly be said that this place of arms should be located conveniently near the state's center of population, and that it should be sufficiently extensive, both in area and plant, to meet all of the very important physical requirements of such a place under such conditions.

Cogent arguments might be advanced in support of the proposition that such an establishment should even now be in the possession of every state, instead of the comparatively few which thus far have been able to appreciate its advantages. Nor would it be useless today, when as yet war is only in the air, or even in times of profoundest peace, for it would serve admirably for the location of the annual camps of instruction now so generally established among our state troops.

This place of arms would, in war times, become the State General Recruiting Depot, with a thorough military organization, and it is here the Medical Sub-Depot should be established.

The organization of the General Recruiting Depot cuts no figure in this paper, except so far as it touches the organization of the Medical Sub-Depot, which latter should be as nearly as possible independent.

The sub-depot should have a distinct and separate organization, the personnel of which, of course, would be under the orders of the depot commander (probably a general officer) though for administrative purposes only. The interior economy of the sub-depot, the instruction of the men; in fact, everything pertaining to the sole object of the organization, the making of the sanitary soldier, should be in the hands of the sub-depot commander—a medical officer—under the direction of the Surgeon-General of the state.

Since we so emphatically claim the direction of the medical sub-depot we are under obligations to suggest some practicable plan for its organization and some scheme for its management. A very general consideration of these points is the *raison d'etre* of this paper.

As the medical department must of necessity provide for the care of the actual sick—an ever present entity—of the entire command, the first thought must be given to them, and temporary hospital accommodations supplied at the earliest practicable moment for at least 2 per centum of the probable garrison. This so-

called "field hospital," of course, should be followed as soon as possible by a more permanent structure. *Pari passu* with the permanent hospital there will be erected quarters for officers, barracks for men, store-houses, stables, bakery, mess hall, etc., the various buildings pertaining to any community, be it civil or military.

Happy the state which, even though it has not these buildings, has officers so far-seeing that plans and specifications for them have already been prepared and filed ready for instant use when the emergency arises which requires them! If all these matters have been fully anticipated and prearranged so far as possible, it is not to be doubted that the necessary plant could be established on a comfortable working basis in thirty days.¹ In the meantime, the permanent personnel could be assembled under canvas.

The work of the medical sub-depot, for which a more or less permanent personnel must be provided, is to be considered under two heads, viz.:

1. The care of the sick of the garrison.
2. The instruction of recruits for the hospital corps.

The duties will necessarily be both administrative and executive. A word as to the meaning of these terms. In military parlance administration means the direction or management of a body of troops. The administration formulates the regulations and orders to govern the command, which the troops execute.

The administration of the sub-depot will require, besides the Commanding Medical Officer, several other officers, non-commissioned officers and private soldiers of the Hospital Corps, all of whom will be essential to its successful working.

The hospital department, capable of permanently housing two hundred patients, with canvas for an additional two hundred, will require a numerous personnel, hereafter to be considered.

The department of instruction will require, approximately, one officer to every fifteen men, and one non-commissioned officer to every five men.

The details of the foregoing outline of our proposed sub-depot may best be illustrated by assuming conditions quite likely to occur in any future war.

¹ On July 8, 1894, the plans and location of the great Japanese base hospital at Hiroshima were approved; on the 30th. of that month the hospital, consisting of ninety-six separate buildings, capable of accommodating 2,555 patients, was completed.

The latest available authority gives the population of the State of New York as 7,152,834, of which number one million men, more or less, may be assumed to be of the fighting age (18 to 45.)

During the war, 1861-65, this state furnished 58 per centum of its fighting population, and undoubtedly would do quite as well in any future war of equal magnitude. But, to remain well within the bounds of probability, we will assume that New York's contribution to the next war will be 500,000 soldiers. We have already seen¹ that of this number, six per centum, 30,000 men, will be required by the medical department. Should the war continue three years we may safely estimate that the proposed medical sub-depot of that state will have a probable average monthly strength of about one thousand men, exclusive of the sick of the station. Upon this estimate the organization of the medical subdivisions would, *mutatis mutandis*, closely approximate those of a regiment of the line.

War having been declared and requisition made upon the authorities of New York for that state's proportion of the number of soldiers deemed necessary by the President of the United States, among a thousand other orders, presumably even today carefully prearranged, one issues from state headquarters directing Colonel — Asst. Surg. Gen., N. Y., to proceed without delay to the General Recruiting Depot and there establish the Medical Sub-Depot. The objects of this special establishment are, as heretofore stated, and as doubtless he will have been informed, the care of the actual sick of the entire depot and the preliminary organization and training of the sanitary personnel of the state's recruits.

Colonel —'s special instructions, which doubtless he has received from the Surgeon-General of his state, inform him that he is expected to select his own sub-depot staff from among the officers ordered for duty there, to organize a station hospital, and the necessary number of companies of instruction. If the state has anticipated the moment of necessity, therefore, and established an adequate plant, or even if it has a detailed paper organization for the proposed sub-depot, the responsible officers on the ground will be saved endless trouble.

¹ Outline of a scheme of Military Sanitary Organization—Proceedings of the Association of Military Surgeons of the U. S., 1897.

If, however, nothing has been done, he will of necessity have to start *ab initio*. It is quite apparent that the first step out of chaos that a commander can make is in the organization of his staff and the distribution of its duties, thereby leaving him free from the numberless details which would divert his attention from more important matters. Hence, Col. ——'s first duty will be to organize and locate the administration.

It may be assumed that the state military authorities will have so far anticipated the personnel requirements of the proposed organization as to have directed the following, or as many of them as practicable, to report at the earliest moment, viz.:

ADMINISTRATION.

- 1 Lieut.-Colonel, Med. Dept., Executive Officer.
- 1 Captain, Med. Dept., Adjutant and Med. Supply Officer.
- 1 Captain, Q. M. Dept., Quartermaster, Subsistence and Ordnance Officer.
- 8 Non-Commissioned Officers. {
 - 3 Hospital Stewards.
 - 3 Actg. Hospital Stewards.
 - 1 Q. M. Sergeant.
 - 1 Commissary Sergeant.

And the necessary number of private soldiers as clerks, artificers, orderlies, drivers, conservancy, cooks, bakers, waiters, etc., etc., probably about fifty—to be determined as the organization develops.

Upon their arrival at the station, the officers will at once be assigned to the indicated duty, and as many non-commissioned officers and men as deemed necessary assigned to the respective departments.

In the meantime, the state authorities, having determined the probable average strength of the garrison and notified the medical authorities, the first consideration of this department *in loco* is to provide hospital accommodations for the estimated sick of the command, which, as we know, will certainly not be less than two per centum of its total strength.

Assuming that the average garrison will be ten thousand, the medical officer commanding the sub-depot directs his quar-

termaster to at once require for tentage and other quartermaster supplies to accommodate two hundred patients—say :

Hospital tents complete.....	54
Wall tents complete	9
Common tents complete	20

Together with the necessary cooking and heating material—fuel, lighting, forage, horses, harness, ambulance and other wagons—clothing, equipage—in fact, everything except medical supplies, ordnance and subsistence. Each tent should be floored with tongued and grooved flooring, and properly heated and lighted. No department is more important than the quartermaster's—it is the *omnium gatherum* from which one seeks everything that cannot be obtained from the very special supplies furnished by the other departments.

At the same time the officer in charge of medical supplies is directed to require for furniture, bedding and other interior fittings; for medicines, dressings, surgical instruments and appliances, special diet, stoves, etc.

The commissary officer arranges for the subsistence of the soldiers actually on the ground, and makes all preparations to meet the ever increasing demands upon his department, which, least of all, can be ignored.

With the temporary station hospital thus prepared, the sub-depot will be in admirable position to meet the requirements of the sick of the station so soon as the personnel of the hospital can be assembled, viz. :

9 Medical Officers.....	{	1 Major Surgeon Commanding.
		2 Major Surgeons.
		3 Captain Asst. Surgeons.
64 Non-Com. Officers and men, H. C.....	{	3 Lieut. Asst. Surgeons.
		2 Hospital Stewards.
		5 Actg. Hospital Stewards.
		35 Nurses.
		4 Cooks.
		9 Attendants.
		9 Med. Officers' Orderlies.

Pari passu with the temporary arrangements above outlined, plans and estimates will be prepared and contracts let for the construction of a more or less permanent hospital building of 200 beds capacity. This, with the temporary canvas hospital in reserve,

will meet all demands that the sick of the station are likely to make upon it.

The probable needs of the sick having been fully anticipated, and, so far as possible, provided for, attention may now be turned to the other important feature of the sub-depot, the department of instruction.

We have heretofore seen that, in addition to the sick of the entire general recruiting depot, the medical sub-depot would have an average strength of about one thousand officers and men of the sanitary corps, the object of whose assembly being their organization into and training for the various sanitary units required by an active army.

These units are :

- 1st. The Station Hospital.
- 2d. The Ambulance Companies of the H. C.
- 3d. The Field Hospitals.

Assuming that any man well trained in the work of the above-named organizations will be able to do his part in the regimental detachments, or in the base or other military hospitals, such will need no further representation at the training school.

The personnel of the administration, and the station hospital having been assigned, there are left of the estimated strength of the sub-depot about nine hundred officers and men to be organized into ambulance companies and field hospital detachments.

We have heretofore shown¹ that each ambulance company requires eighty-eight officers and men and each field hospital sixty, including in both cases transport personnel. Based upon this, there could be organized six ambulance companies and six field hospitals.

The personnel should be distributed as follows :

For each Ambulance Company—

- | | |
|-------------------------------------|---|
| | { 1 Major Surgeon, Commanding.
1 Capt. Asst. Surgeon.
1 First Lieut. Asst. Surgeon. |
| 3 Medical Officers. | |
| 1 Quartermaster First Lieutenant. | |
| 16 Non-Commissioned Officers, H. C. | |
| 2 Buglers, H. C. | |
| 2 Artificers, H. C. | |
| 64 Privates, H. C. | |

¹ Proceedings Association of Military Surgeons of the U. S., 1897, p. 437, et seq.

For each Field Hospital—

- | | | |
|------------------------------------|---|-------------------------------|
| 3 Medical Officers. | { | 1 Major Surgeon, Commanding. |
| | | 1 Capt. Asst. Surgeon. |
| | | 1 First Lieut. Asst. Surgeon. |
| 8 Non-Commissioned Officers, H. C. | | |
| 1 Artificer, H. C., and | | |
| 48 Privates, H. C. | | |

These organizations must, of course, be properly quartered. Tents will meet the early requirements very well, but would prove expensive and inadequate for prolonged use. In addition to those for the station hospital, more or less permanent structures must be provided as follows:

- 1 Administration building containing offices for the commanding officer and staff.
- 1 Storehouse for medical, Q. M., ordnance and subsistence supplies.
- 1 Stable and wagon shed.
- 6 Barracks for ambulance companies.
- 6 Barracks for field hospital detachments.
- 1 Mess hall, kitchen and bakery.
- 1 Soldier's exchange building.
- 1 Building for officers' quarters.

It will be observed that no provision is made for separate quarters for individual officers, nor is it believed that under the conditions, such will be necessary.

Having so far as possible provided for the material wants of our proposed corps, let us now briefly consider what means shall be adopted to lay broad the foundation of discipline, training and instruction, which are to convert the crude recruit into the finished sanitary soldier. Much depends upon a proper beginning. If officers and men can be given a comprehensive idea of what they are expected to do, even though ignorant of the nice details, they will be, by so much, more efficient. Add to this practice, tinctured by zeal, and perfection will ultimately be attained.

Anyone who reads even only what is here written must be convinced that there is something more to be done by the civil practitioner of today who tomorrow may follow the drum, than pack his valise and join the procession. His knowledge as a physician is, of course, a *sine qua non*, but not so very far behind

this even is that knowledge which will enable him to supplement his own hands by those of others, and thus, and only thus, will he be able to properly care for the numberless sufferers thrust upon him within a day, or even an hour. Nor is this all, for the conditions under which these sufferers must be treated are so different from those which obtain in civil life, that his practice must be modified accordingly.

Revenons a nos moutons. Beside the general administration necessary to an aggregation of military units, each unit has within itself an administration which regulates the interior and exterior relations of its individual members. In a company this administration is represented by the officers and non-commissioned officers. The immediate commander of a unit is held responsible for the efficiency of his command, and to promote this efficiency he is given a certain number of assistants, who in military parlance are known as officers—commissioned and non-commissioned—whose duties within certain limitations he prescribes. Wagner says: "The most efficient armies are those in which the captains are given the greatest latitude in the methods of instructing and providing for their companies, and held to the most rigid accountability for their good condition and military efficiency."

Our proposed sanitary units must be organized on military models as above outlined, and the commanders thereof must be held to the same accountability. Unfortunately, we have as yet no sanitary model and no standard other than that of the line.

Since such is the condition of affairs, how would a medical officer proceed who had received orders to organize and command an ambulance company? A military body to be hewn out of some eighty or more intelligent citizens, most of whom will have no knowledge of what is expected of them, his first step would be to make his *cadre*, or frame work.

Doubtless two or three physicians who had been appointed officers, and who will make up in zeal what they lack in knowledge of the work in hand, have already reported to the company commander. These, with the senior non-commissioned officer, whom the commander selects from among the men, and who is practically the company adjutant, form the foundation of the frame, the superstructure of which is the remaining non-commissioned officers.

Considering the work and equipment of this company, there is room in it for a non-medical officer, who might be called the quartermaster, who would rank as a first lieutenant, and have charge of the property and transportation.

The frame having been completed, no matter how temporarily, the details are to be fitted therein. The company should be divided into two platoons, each under a medical officer and a transport detachment, the latter to consist of—

- 3 Non-Commissioned Officers.
- 2 Artificers. } 1 Blacksmith.
- } 1 Saddler.
- 1 Bugler, and
- 17 Privates } 14 Drivers.
- } 1 Cook.
- } 2 Supernumeraries.

Under command of the quartermaster.

It may be that the details will not at first fit the frame with accuracy, but they will do so at least approximately and in due time, with judicious trimming, perfectly.

As new men join the company they can at once be assigned to one or another of the subdivisions, and fall into their proper places.

The field hospital detachments will, *mutatis mutandis*, be organized on the same lines, the sixty or more individuals constituting such, being so subdivided as to best accomplish their work. The transport detachment with this organization will consist of

- 4 Non-Commissioned Officers.
- 1 Artificer (blacksmith).
- 12 Privates } 10 Drivers.
- } 2 Supernumeraries.

Thus far we have provided a place of rendezvous and a habitation. We have anticipated the material requirements of the men of the proposed sanitary corps as to food, clothing and equipment, and we have assigned them to organizations. It now remains for us to consider the best method of discipline, training and instruction we can adopt, to fit them for their work.

It may be safely assumed that, for the most part, the recruits assigned to the hospital corps will have had some training in civil life, as druggists, clerks, nurses, mechanics, hostlers, cooks, etc.,

etc., which would cause their selection for this special corps, and more or less prepare them for its peculiar duties. This, added to the fact that "with intelligent and zealous volunteers, discipline becomes mainly a matter of instruction and guidance," will make a well-considered scheme of training comparatively easy of execution.

In the beginning of hostilities, it is not probable that any state will be able to hold its men for more than one month's training, when it will be called upon to send complete organizations into the field. Later, when a sufficient number of sanitary units have been supplied, it will only be necessary to keep up their strength, and the units of instruction will become more or less permanent, the officers and men attached being detached when required.

The training of the sanitary soldier must be military as well as technical, for it goes without saying that he must be a *soldier*, thoroughly disciplined and especially loyal to his duty. His work is most frequently done upon his own responsibility, and away from the watchful eyes of his superiors; moreover it is often done under circumstances of extreme danger, without the support of "touch of elbow," and the comforting thought which the fighting soldier has, that come what may, he can "give as good as he gets."

Anyone who thinks that a man without a gun cannot be a soldier, even though he does and dares all that any man can, is hardly in accord with the public sentiment which responded so warmly to the story of Piper Findlater at the charge on Dargai Ridge.

True discipline being the object sought, certainly no method of its attainment can be equal to the military method, since this is the concrete result of experience in discipline from the earliest times even until to-day. Therefore our recruit must be trained as is any other; he should be carefully "set up" and thoroughly drilled in the school of the soldier and the company, so that he will understand and be able to accurately execute all the movements therein described. He should be taught the manual of arms, and the use of the rifle, "For though he will ordinarily neither carry nor use firearms, it is held that no man can be a soldier who is unfamiliar with them"; moreover it is universally recognized that nothing so quickly teaches unquestioning and ready obedience to orders as frequent exercise in the manual of arms. There is

something seriously suggestive about a rifle that does not attach to apparatus for light gymnastics.

Another exceedingly important part of the military training is to teach the recruit how to care for himself under the peculiar and varying conditions of his new life. This comes to him through the company housekeeping, for in the field each organization takes care of itself, cooks its own food, makes its own beds, does its own policing (cleaning up); in fact, a military company may be considered as a family, the head of which is the commander, who is the director, instructor, provider and dispenser. The commander should regard his men as does a father his children; and they in turn should render him the respect and implicit obedience due from a son to his father.

Certain modifications of the company housekeeping, while it is at the sub-depot, would probably be found desirable; there a general mess for the entire command (except the hospital) would be more convenient. This mess should be so conducted as to serve as a school of cookery in which the largest possible number of non-commissioned officers and men of each organization should be given an opportunity to gain a practical knowledge of the management and cooking of the ration.

The technical training of the sanitary soldier will be imparted through lectures, recitations, demonstrations, and practical work. He must be thoroughly taught first-aid and nursing, which include a sufficient knowledge of simple anatomy, physiology, pharmacy, diet, cooking, bandaging, etc.; he must know the appliances of the medical department, particularly those pertaining to the field. His instruction in field work becomes of the utmost importance, since his duties will be performed under active service conditions, pitching and striking tents, loading and unloading wagons, the particular work of the various sanitary units, the care and driving of animals, etc., etc. Bearer drill, the purpose of which is to teach the best method of transporting the ill and injured is a very important part of this training.

Of course, all this can only be outlined here, but certainly enough has been written to show that the men we must have, are no more or less born than any other soldiers; they must be made, and can only be made by the most careful selection and training.

If only for purposes of instruction, it would be desirable that the equipment for at least an ambulance company and one field hospital, complete in the minutest detail, be supplied the sub-depot, so that all could learn the material and its uses.

The routine of a day's work would be somewhat as follows :

- 5:00 A. M.—Reveille.
- 5:15 to 5:30 A. M.—“Setting up” exercises.
- 5:30 to 6:00 A. M.—Breakfast.
- 6:00 to 7:00 A. M.—Fatigue.
- 7:00 to 8:00 A. M.—Study hour.
- 8:00 to 9:00 A. M.—Infantry drill.
- 9:00 to 10:00 A. M.—Recitation in nursing.
- 10:00 to 11:00 A. M.—Study hour.
- 11:00 to 12:00 M.—Recitation in first-aid.
- 12:00 M. to 1:00 P. M.—Dinner.
- 1:00 to 2:30 P. M.—Bearer drill, litter, ambulance, travois, etc., as soon as possible combined with first-aid.
- 3:00 to 4:00 P. M.—Formation of ambulance and dressing stations, alternating with the pitching of the field hospital.
- 4:00 to 4:30 P. M.—Practical bandaging and splinting.
- 5:00 to 5:30 P. M.—Supper.

As soon as the men became sufficiently informed, a certain number of them would be detailed each day in the station hospital, for practical instruction with the actual sick, and in the interior economy of military hospitals. Certain others would be detailed in the mess-hall and kitchen, and yet others in the other departments of the sub-depot, until a fairly comprehensive knowledge of the required work would be gained. With such preliminary training the sanitary recruit would join his permanent command with an intelligent appreciation of what would be required of him—certainly an immense advantage to him and to the service of which he will form part.

The chief object of the foregoing remarks is not to offer the best plan for organizing a State Medical Sub-Depot, but rather to call attention to the fact that some such organization will be necessary.

Our country cannot again afford the time, the blood, and the treasure spent during the first two years of our last war to learn how to care for the wounded of the next; neither can we begin where that war left our sanitary organization, admirable as it then seemed.

A generation has passed since then and military sanitation has no more marked time than have other arts. The ambulance corps of that day, taken from the fighting effective; hospital attendants detailed from the line regiments as the situation demanded, or improvised from convalescents, excellent as was that improvisation by comparison, was but a step in the evolution of a sanitary corps, and will no more be permitted in our next war than will the surgical procedure used in the last. Our sanitary corps must be distinct and separate from all other branches of the service, its organization and training must begin with the State medical departments, and its recruitment must be continued by them. Ambulance Company No. 50, N. Y., will be just as distinctive in that State as the 50th. Regiment of Volunteers, N. Y., and Field Hospital No. 35, N. Y., as Light Battery B, N. Y. Artillery.

By some such organization, and only such, can our sanitary corps reach the highest efficiency.

VANCOUVER BARRACKS, WASH., JANUARY, 1898.

XXIV. SOME OBSERVATIONS OF A VOLUNTEER MEDICAL OFFICER.

By FRANK W. HENDLEY,
LATE MAJOR AND SURGEON, OHIO VOL. INF.

THE experience gained during the brief war with Spain demonstrated clearly that neither the Medical Department, nor any other department, of a large army intended for immediate active service, can be organized successfully in a few weeks.

Zeal, enthusiasm and industry can accomplish great results, but experience and training are essential to early success.

The volunteer medical officer, during the Spanish War, had, of course, a world of new things to learn. Even those officers, coming from an experience in the most improved National Guard service, and having had the great benefits derived from participation in the work of this Association for several years, found that they possessed but the rudiments of the knowledge required.

What must have been the difficulties experienced by that large number of medical officers who had not enjoyed the benefits derived from either or both of these great training schools?

If we are to prepare for the future by learning from the past, it seems to me that we can take courage and go on in confidence if we but profit by the lessons learned last year.

In the first place, the medical departments of the National Guard must conform closely to the plan and system practiced in the U. S. Army in all its details. This has been done for several years with more or less completeness in several states, notably Minnesota and Massachusetts, and probably in others also, but many states, including my own (Ohio) still retain the obsolete and unsatisfactory regimental medical organization. Such organization can only be successful in exceptional cases where exceptional surgeons serve under exceptional regimental commanders.

This Association has recognized this situation and appointed a committee to prepare a plan for securing uniformity in the medical departments of the National Guard.

The Association should go further and use its great influence in Congress to secure the enactment of a law placing the National Guard under the control of the General Government, as it is only through such a law that uniformity can ever be secured. To depend on state legislative action for uniformity, is to expect the impossible. Many men are of many minds, but many legislatures seem to have no minds at all.

Until every National Guard has its Medical Department exempt from regimental dictation, its officers selected by rigid examination and promoted for service and proficiency only, its Hospital Corps required to attain a certain standard of intelligence and efficiency, and possessing medical supplies and property at the same time ample and in compact form, and until all records, reports and other paper work are made in precisely the form which would be used in active field service, we shall not be prepared to go into such active service, and will not have profited by the lessons of 1898.

In addition to this, National Guard surgeons should in much greater number identify themselves with the work of this Association, attend its meetings, discuss the various military medical problems considered, and thus come into closer touch with the medical work of the regular establishment of the Army.

Among the papers read at former meetings and printed in the annual Transactions of this Association are many that would have been of immense value to many volunteer surgeons last year.

I believe that a judicious compilation of a number of these papers and their publication in pamphlet form by the Surgeon-General's Office, would be of great benefit even now, to the surgeons of the twenty-two new regiments and to recently commissioned officers of the Army. It is certain that they would be of great service to National Guard surgeons who have no other means of knowing what are the best and most advanced ideas on such subjects.

Whatever of inefficiency existed last year among volunteer medical officers, existed by reason of lack of knowledge and inability to obtain such knowledge. The desire for information existed then and still exists, and this Association should provide means for supplying the deficiency.

If some of the carefully prepared papers from able authorities, that are in our Transactions, had been placed in the hands of all medical officers during May of 1898, many errors, of omission and commission, would have been avoided, this Association would have been strengthened and there would have been a friendlier feeling on the part of Army officers toward their brethren of the volunteer service, so that there would have been less working at cross purposes, and less irritation of busy men by the necessity for frequent explanation and reiteration of matters which to them probably seemed to be trivial or elementary.

If regulars and volunteers are to work together again, there must be a more complete harmony of action, a mutual desire to promote efficiency; on the one hand, the capacity and desire to receive information and instruction, and on the other, the willingness to impart such information.

With a knowledge of the forms of records, reports and other paper work and experience in their use referred to above, there should be a prompt furnishing by the central authority, of the books, blanks and forms necessary, otherwise there is made a bad beginning which can only be expected to lead to a bad ending.

Whatever form a future increase of the Army may take, whether National Guard regiments are to be taken as organizations or whether regiments of U. S. Volunteers are enlisted, the National Guard will continue to furnish the preliminary training and to popularize the military spirit.

Especially will it be the training school for officers, and we know that we can judge of the efficiency of an organization by the proficiency and ability of its officers.

A governmental control of the National Guard, strictly military and not political, with careful organization of the staff departments on plans uniform with the Army, and absolute non-recognition of "independent" companies or other imperfect troops, would develop a National Guard indeed worthy of the name, to which the Army could look with respect and confidence, and which could be safely regarded as one of the immediate defences of the Nation.

In making physical examinations of troops for muster-out, a number of men presented themselves who drew pensions for service during the War of the Rebellion and who were anxious that

the report of examination should show, at this time, the same disability for which they received pensions, and in some cases a careful examination failed to reveal the disability claimed. It was impressed upon me that in order to ensure fair, impartial and correct reports upon pension applications, such applicants should not be examined by local civilian medical boards, but by boards composed of army surgeons detailed for that purpose and transferred frequently as in other service details. This plan, if carried out, could not be objected to by any honest pension claimant and would ensure justice both to the claimant and to the government. At the same time it would provide for a large increase in the number of Army Medical Officers, thus furnishing a large force of thoroughly qualified surgeons available for service in the event of a sudden expansion of the Army such as occurred last year.

XXV. ONE OF THE LESSONS OF THE SPANISH WAR.

BY MAJOR A. C. GIRARD,

SURGEON, U. S. ARMY; (LATE LIEUT.-COL. AND CHIEF
SURGEON, U. S. V.)

THE Medical Department of the United States Army, regular or volunteer, has not been an unqualified success during the Spanish war, and my purpose is to show that the failure is not due to lack of zeal and devotion from the highest to the lowest, but a defect in organization, which did not permit the sudden expansion of an army of 25,000 to ten times that number (however great individual efforts might be made), without shortcomings which, under the system, were inevitable. The two great complaints were lack of supplies and incomplete organization.

During the Civil War, the supply system of the Medical Department was under the charge of Medical Purveyors and storekeepers, men who had shown great adaptability for this kind of work. This class of public servants, a number of years after that war, was abolished by law and assignment of medical officers, irrespective of their administrative ability, solely on account of seniority, made in their place. This was a direct result of law and cannot be charged to the head of the Medical Department.

The result was, when the Spanish war burst upon us, we had no officers specially trained to supply the Medical Department—no force of clerks equal to a tenfold task, and the result was scarcity of medical supplies through delay in purchase and shipping. This delay was increased by the necessity of shipping through the Quartermaster's Department, which in itself was overburdened with transfer and shipment of war materials of other kinds.

I believe that if the system of the Civil War were re-established and a corps of medical purveyors formed, not part of the Medical Department, not necessarily professional men, but good, reliable business men, a repetition of the lessons of the Spanish war could be prevented.

There should be a Chief Medical Purveyor with the rank of Colonel, whose office would be in the Surgeon-General's office and

who should have charge, under the orders of the Surgeon-General, of all the medical supply depots. These depots should be three, as at present, and each in charge of a Purveyor with the rank of Major.

In addition there should be, in peace times, an Assistant Purveyor with the rank of Captain, as Supply and Property Officer at the headquarters of each department, to be the technical assistant of its Chief Surgeon in revising requisitions and estimates of construction. In war times these Assistant Purveyors could be assigned as Corps Supply Officers and make the issues to the regiments in their corps, and if necessary, the purchases of medical supplies. This would subdivide the work of issue and relieve the pressure on the principal purveying depots. I was authorized by the Surgeon-General to introduce this system in the Second Army Corps and it proved a success. When the supplies came in slowly, issues were made for a few days at a time and without extra cost to the Government, liberality could be practiced, when the supplies became plentiful.

I disclaim any intention of criticism of the medical officers in charge of the depots, on whom the war with Spain burst like a thundercloud, and it must be remembered that medical supplies cannot be purchased like cattle or dry goods in an almost unlimited market. I believe that a still greater step towards certainty of supplies of the Medical Department could be made, if we imitated our late antagonist, Spain, which in a small factory, run by its apothecaries and men of the Hospital Corps, prepared nearly all the medicines and surgical dressings for its army of about 240,000 men stationed in Spain, its African colonies, Cuba, the Philippines and its penal colonies, at a ridiculously low cost.

Since the United States have entered the rank of the nations which control this globe, the certainty of repeated wars increases, and it would be suicidal policy to return to our hand-to-mouth system, to be found unprepared in the next emergency.

This can only be prevented by a corps of officers trained in the purchase, preparation, care and issuing of the medical supplies. It is not necessary for me to consume further time to convince you of this fact.

Another cause of the lack of success of the Medical Department is the multiplicity of duties imposed upon medical officers,

not permitting special proficiency in all of them. In addition to the purely professional and sanitary work, medical officers have to see after provision of food, water, fuel for the sick, the providing of necessary mounts, and mules, their care and feeding, ambulances, the professional and military equipment and paper system of the Hospital Corps, preparation of estimates, plans and specifications for any work connected either with temporary or permanent hospitals.

This can be attended to more or less well by trained medical officers in peace time, as the methods of doing this work are more or less understood by those, who have been a number of years in the service and learned them practically, or by those who learned them theoretically in the excellent preparatory school now under the charge of Colonel Alden.

We should, however, prepare for more serious business than our skirmishes with Indians or even the present small war going on in the Philippines, and the small number of trained medical officers, regular or volunteer, in serious war would soon be absorbed by casualties, and new men would have to step in.

In the field, at least one-third of the work now done by medical officers could be done, and probably better done, by laymen.

Professional men, as a rule, are not practical men, are unacquainted with business methods, unused to control men, ignorant of the practical education of life. Their training principally has been directed to observation and cure of disease and not to struggling with the executive and administrative problems, which the majority of men have to meet sooner or later in other paths of life.

For this purpose there should be a corps of officers, a few of whom have been authorized during the late war and who, in my limited experience, have proved of great benefit,—they are at present called quartermasters—perhaps a better name would be ambulance officers. During the Spanish War one was allowed to each division hospital. They proved very efficient, but would become more so, if they occupied this position permanently, instead of as a detail, when they have to learn their duties at the expense of the institution to which they are assigned.

The experience of the war has demonstrated also that while the division hospital in warfare of any severity or magnitude is the only possible way of taking care of large numbers of wounded

without impeding the fighting force, the regimental hospitals, with the present large regiments and consequent greater distance from the division hospitals, are a necessary factor in the care of the sick. This means the additional work, which in my opinion could better be performed by a non-professional officer and in addition leave the medical officers untrammelled at the times when all their professional knowledge is needed for the care of the sick.

In preparing for war we must have in view the proper way of meeting the great strains, not the perfunctory every-day routine. A system, which would be sufficient for service of peace, will be absolutely inadequate in time of actual war. It seems therefore necessary that the medical service be relieved from all duty, which under supervision of its officers can be better performed by trained non-professional men.

In order to bring this about I would suggest the establishment of a corps of quartermasters or ambulance officers for the Medical Department and solely under its control.

The chief should be a chief quartermaster with the rank of major, stationed in the office of the Surgeon-General, with general control over the officers of his corps,—the consideration of construction, equipment and accountability outside of medical supplies proper. This officer might with propriety have the supervision of the affairs of the Hospital Corps,—assignments, equipment, etc.

There should be a quartermaster of the Medical Department or ambulance officer with rank of captain, for each Department headquarters, Chief Surgeon of an army corps, or general hospital to relieve the Chief Surgeon of personal attention to the many details mentioned above. In peace time there should be a fully equipped medical train at each Department headquarters under charge of this officer; in war time the ambulance trains and everything of the corps pertaining thereto should be under the care of that officer. He should be qualified to act as adviser to the Chief Surgeon in all matters relating to repair and construction of permanent or temporary hospitals.

There should be an assistant quartermaster, or assistant ambulance officer, with rank of first lieutenant, on the basis of one to each regiment, to take charge of everything pertaining to the care of the sick, except the medical, surgical and sanitary service.

I believe that the volunteer medical officers, who served in the war with Spain, will agree with me that their work would have been greatly facilitated if they could have had at their disposal an ambulance officer or a quartermaster to look out for the shelter, food and transportation of their sick.

I do not presume to assert that this proposition is the only feasible one, or necessarily the best one. It will be a great step in the proper direction, that of making the Medical Department as autonomous as a regiment of infantry or a battery of artillery; not only autonomous, but with its peculiar equipment, such as has been adopted by every nation prepared for war.

If our Association agrees with me that a different organization is necessary for success, it is the very body which can bring about the necessary legislation, as members from nearly every State are present and can use their persuasive power to enlist the legislators of the country in favor of some suitable bill.

I would therefore suggest that a committee be appointed to draft a bill to add to the army establishment a corps of medical purveyors and one of quartermasters of the Medical Department or ambulance officers.

I would suggest that one member of the committee be a regular medical officer on duty in the Surgeon-General's office or in Washington, in order to enable the committee to act in accord with the Surgeon-General, and thus secure his support,—that another member of the committee be of the volunteer service, and another of the National Guard, men of push and energy, and that perhaps another medical officer of the regular establishment be added.

This committee should draft a bill which should be carefully examined by a competent officer. I would suggest a judge advocate of the Army. This bill should be submitted to the Surgeon-General and would, as it is assumed that the committee had acted in accord with his views, be submitted by him to the Secretary of War, and by him to Congress.

It is not a question which can be solved in a day. The revival of the Purveying Department has its objections which will have to be carefully considered, and these objections, which led to the abandonment of the system, will have to be met. The method of appointment of both purveying officers and quartermasters and

the qualifications demanded should be carefully specified. The law should be so framed as to allow the purveying officers to make contracts for contingencies and store up imperishable articles in considerable quantities, from which current issues could be made.

A most important addition to the Medical Department and (as we are dealing with frail mankind, which not always is equal to the demand, either from indolence or lack of ability), of paramount importance to success,—which means life and health and fitness for work of the army,—is a provision in the law reorganizing the army (a necessary sequel of the present war), for the position of medical inspector, not a result of regular promotion, but selection of men most fitted by temperament, service, intelligence and devotion to duty. These inspectors should have the rank of Colonel and Lieutenant-Colonel respectively, and part of them be under the control of Chief Surgeons of departments or corps, and under orders of the Department or Corps Commander,—part under direct control of the Surgeon-General and under orders of the War Department to inspect every branch of the Medical Department and the sanitary care and condition of the troops; in the former case to report delinquencies or defects to the Corps or Department Commanders—in the latter to the Surgeon-General direct for the information of the War Department. Of these inspectors there should be one for each department or corps and a number for duty with the Surgeon-General. The benefit of rigid and frequent inspections cannot be overrated. Many shortcomings in the Spanish War would have been reached and corrected which the Surgeon-General and his Chief Surgeons, with their multifarious and complicated duties, could not detect, and much blame would have been thereby avoided.

XXVI. A SHORT ACCOUNT OF THE YELLOW FEVER EPIDEMIC OF 1897, AND MORE PARTICULARLY ITS RELATIONS TO THE GARRISONS OF THE REGULAR ARMY, STATIONED IN THE REGIONS AFFECTED.

By W. C. GORGAS,

CAPTAIN AND ASSISTANT SURGEON, U. S. ARMY.

As so often occurs in the epidemics of yellow fever, the disease, during this year, had been going on at Ocean Springs, Miss., and its character had been under discussion there for some time before it was recognized. Men of extensive experience, and undoubted ability, in the recognition of this disease, such as the health authorities of New Orleans, and Louisiana, came over, and after a careful examination of a number of patients, came to the conclusion that the disease was not yellow fever, but dengue. And indeed, the disease in most of the places where it prevailed, was of a very mild type, and the death-rate was so low, and the typical cases so few, that its recognition was beset with most unusual difficulties.

During August, a great deal of sickness occurred at Ocean Springs, which the local physicians looked upon as unusual in character, but, as there had been no fatalities, they came to the conclusion that it was dengue.

Ocean Springs is a small town on the Gulf coast of Mississippi, connected with Mobile and New Orleans by the Louisville and Nashville Railroad. It is one of the many small towns between these two cities much frequented during the summer months by the inhabitants of both cities as a resort. Business men keep their families there during the hot weather, going to and returning from the city morning and evening.

During the last week of August, several deaths occurred at Ocean Springs from the disease. One of these was a prominent physician of New Orleans. This at once attracted the attention of the health authorities of the neighboring states, and led to a careful investigation by these bodies, but the class of cases seen was of such mild type, that they agreed with the local physicians

in considering it dengue. Other deaths occurring soon, and autopsies having been obtained, led to the recognition of the disease as yellow fever about September 1st. The light character of the disease, leading to its tardy recognition, and the very intimate and general communication between Ocean Springs and Mobile and New Orleans, gave unusually favorable opportunities for its spread. As families from all parts of these cities were spending the summer at Ocean Springs, and members of these families going and returning daily, numerous points of infection appeared in parts of the cities widely separated.

Early in September, cases developed in Mobile and New Orleans, and slowly spread on the lines of railroad diverging from these points, extending as far West as Texas, and East to Montgomery, Ala. Its Northern limit was in the neighborhood of Jackson, Miss. A few cases occurred outside of this area, but not to an epidemic extent. The military garrisons within the affected area were at Jackson Barracks, New Orleans, and at Fort Barrancas, Pensacola, Fla. Two batteries of the First Artillery were at each place at this time. The garrison of Fort Barrancas suffered from an unusually severe epidemic of yellow fever in 1875. General Sternberg, the present Surgeon-General of the Army, was the medical officer in charge at the time, and was very ill with the disease. For many years after this, it had been the habit of the Department to move this garrison early in the summer up into the neighborhood of Atlanta, Ga., to return about December 1st. But the sanitary improvements in the post have been so great, and the general health of the command so much improved, that of late years this has not been so regularly done. The last epidemic in Pensacola was in 1883. Fort Barrancas is eight miles south of Pensacola, at the mouth of the harbor, and divides with the Pensacola Navy Yard, a peninsula connected to the mainland by a very narrow neck. This peninsula is easily quarantined from the surrounding country. Lying between the Post and the Navy Yard, on the naval reservation, is the town of Warrington, with a population of about a thousand inhabitants, mostly negroes. The Post of Barrancas is located on a sandy plateau, elevated some thirty-five feet above the bay and the surrounding country. For beauty, and from a sanitary point, the location leaves little to be desired.

Early in September, when the first cases were recognized in New Orleans, the garrison at that point was moved to Atlanta. Dr. Robert Woodson, the surgeon, was left behind with a few men in charge of the Post.

At the same time, when yellow fever was first recognized at Ocean Springs, the commanding officer at Fort Barrancas was given authority to move the garrison north to Chickamauga Park, near Chattanooga, Tenn., whenever he thought it necessary. The authorities of the Marine-Hospital service, and the State Health Officer of Florida, were consulted, and arrangements were made with the railroad so that we could move at short notice. It was thought that the disease would slowly spread, and that there would be an abundance of time for moving when it got nearer, and that even if the post of Barrancas should become infected before other points in Florida, and we were not allowed to travel on this account, we had plenty of room, and good sites for sanitary camps near the Post. As we had no communication whatever with the outside world, except through Pensacola, it was thought that points in Florida, along the railroad, and Pensacola, would become infected before Fort Barrancas. I, as Surgeon, strongly advised this course.

Pensacola is situated about forty miles south of the line of the Louisville and Nashville Railroad, connected by a branch line, which joins the main road at Flomaton, Ala.

The Health Board of Florida, under the able supervision of the State Health Officer, Dr. J. Y. Porter, established a quarantine at the State line, as soon as yellow fever was recognized at Ocean Springs.

The fever slowly spread east from Ocean Springs, reaching Flomaton, the Pensacola junction, about October 1st. Here there was quite an extensive epidemic, but no cases spread south of the Florida line. By November 10th., it was considered that the epidemic was over as far as its further spread was concerned. Alabama, Mississippi, and Louisiana had raised their quarantines, and Florida was relaxing hers as far as freights were concerned. We were all congratulating ourselves upon the skill shown in keeping the fever out of Florida, and upon our good sense in staying quietly at home. On November 15th., it was announced that a death from yellow fever had occurred the previous night in

Pensacola. It was a well-marked case, seen by several physicians of large experience in yellow fever, who were also present at the autopsy, and all agreed in the diagnosis of yellow fever. The Post and the Navy Yard immediately quarantined against Pensacola, but it was so late in the season that no great uneasiness was felt as to our being troubled.

On November 12th., one of our men was admitted to the hospital with fever. He said that he had a chill in the morning, and was feeling bad. Dr. C. C. McCulloch had been assigned to the duty of looking after sick call, and the ward. But as chills and fever were quite a common occurrence, the man's case did not strike him as anything unusual. On the 16th., the fifth day, Dr. McCulloch asked me to see the case, saying that he thought it suspicious. I agreed with him that it was suspicious, and reported it as such to the Post Commander, Naval Commandant, and the State Board of Health. The patient died on the 18th., having had black vomit, and other well-marked symptoms of yellow fever. The autopsy confirmed the diagnosis. Three other suspicious cases having been admitted between the 16th. and the 20th., I advised that the command be moved out of the post into camp about two miles away. This was done on the 21st. One case was admitted from the camp on the 23d., which was our last case. In all we had five cases, with two deaths. As soon as the first case was looked upon as suspicious, the hospital, and all who came in contact with the sick, were strictly isolated from the rest of the garrison, and when the troops were moved into camp, a strict quarantine was established between the camp and the post. All the fever cases came from one building, the barrack, and I look upon this as the only point of infection in the garrison. To explain how it became infected I have no plausible theory. I hardly think the first case could have been the cause of infection. If such had been the case, we should have expected several weeks, more or less, to have elapsed, between the importation of the first case, the infecting cause, and the development of subsequent cases.

This epidemic illustrates very well several peculiarities in the mode of the spread of this disease: In the first place, the impossibility of making a land quarantine entirely secure. Our garrison was as well situated as was possible for protection in this way.

The State of Florida had a most excellent and efficient quarantine at the state line, and also for the harbor of Pensacola. The maritime quarantine has been in successful operation for the last fifteen years, and in that time no known case has been imported from the shipping, though every year infected ships come to the quarantine station. And beside all this, the naval and military authorities had a very thorough system of inspecting all people entering the reservation. Secondly, that the disease does not spread from person to person, but is contracted from frequenting an infected building or locality, and that it is a difficult thing to infect places free from disease. But that when once a building or locality becomes infected, the large majority of non-immune persons exposed to this infection contract the disease on very short exposure. This is probably due to the fact that the micro-organism causing the disease is very difficult of growth, but when once it finds surroundings suitable, it multiplies with great rapidity. This point was very well illustrated in our case. Only one building seemed to have been infected, the barrack, and though communication between that and the other occupied buildings about the post was intimate, none of the others became infected. The first man taken sick was treated in the ward of the hospital with twelve non-immune men from Friday till the following Tuesday, yet none of these men developed the disease. The doctor, steward and all the attendants were non-immune. The five cases were all treated in the hospital without apparently infecting it. The attendants, and all patients not having yellow fever, were put into tents near the hospital as soon as the disease was recognized. Though the men of the command moved out of an infected building, necessarily taking with them infected clothing, blankets, etc., they did not infect their camp. This point is even better illustrated by my experience in a former epidemic, that of 1882, at Fort Brown, Texas. Here the first case in the garrison occurred about May, and from that time on to the middle of September many cases were treated in the hospital. Although the doctor, steward and all the attendants were non-immune, not a single case occurred among these people. Between the middle of September and 1st. of October, I, with most of the attendants, came down with the disease, the inference being that though infectious material was being constantly introduced

into the hospital for four months the locality did not become infected. About the middle of September, the conditions becoming favorable for the development of the micro-organism, the poison became sufficiently concentrated, and infected most of those who lived in the building. About the first of August the command of some three hundred men moved into a camp three miles from the post. A case developed in the camp on the first second and third days respectively. The camp was then moved, when no more cases occurred. Yet in each of these camps there must necessarily have been a large amount of infected clothing, bedding, etc. These examples illustrate how difficult it is to infect new localities when the surroundings are not favorable for the development of the disease.

From my experience with yellow fever in military hospitals, I think that this disease can be treated in them without infecting them, and, unless the building does become infected, the physicians and attendants are not liable to contract the disease, if the same minute care is taken, for instance, with the yellow fever patient, as is taken to render a surgical patient aseptic.

These two instances illustrate very well the length of incubation. Most writers give very long periods as possible, from twenty-five to thirty days, basing their deductions on the fact that individuals go to an infected locality on a certain date, and develop the disease a certain number of days afterwards. But in these instances it is impossible to say when the person became infected. It may have been a week, or two weeks after he first entered the infected district. But on the other hand if you take away from an infected point a number of non-immune people, and place them in a non-infected locality, then any person developing the disease after that change must have contracted it before, and if you take any number of instances of that kind, it fixes with fair accuracy the limit of incubation. In both of these cases the last man was taken down on the third day after leaving the post.

These two experiences have impressed very strongly upon me the all-important need, as far as military bodies are concerned, of prompt deportation to an uninfected locality as soon as it is discovered that the command is infected. Nothing in my experience with yellow fever as it affects troops can compare

with moving, and all other measures are of small importance. If military necessity obliges the command to stay where it is, I would get the men out of barracks into tents, if only a few yards away. Of if already in tents, move the tents a few yards onto fresh ground. And while it is desirable to get as little infected material into the new camp as possible, usually the element of time is more important, so that it is better not to attempt to disinfect the clothing, bedding, etc., but to let these things be taken out as they are, and trust to airing, washing and such means as can be improvised in the new camp.

At any rate, in the two instances above referred to, we had no trouble, although we must have taken a large amount of infected material to our camps. Of course, every measure should be taken to keep the post in such a sanitary condition that, even if cases are imported, there will be no nidus for the development of the infecting material. At the same time, I would make every effort to keep the infection out by quarantine and similar measures. I would isolate the sick, but not make the intra-garrison quarantine too strict. For some reason there is no epidemic or contagious disease that causes the fear and panic that yellow fever does. I do not know why this should be, but this fact impresses everyone who sees an epidemic. Excessive intra-garrison quarantine heightens this feeling. I would advise the commanding officer to err on the side of being a little reckless, rather than too cautious in the exposure of himself. I would a great deal rather serve under a commanding officer who had to be advised now and then on account of too great recklessness, than under one who is frightened.

All the cases suspected of being yellow fever should be sent to one hospital. The result in the individual case depends in great part upon the first few days of rest and treatment. I doubt if there is any other disease in which this is so important as in yellow fever. For this reason I would not have an observation hospital and then transfer patients, after a diagnosis of yellow fever has been made. It is better to have a few non-yellow fever cases in the yellow fever hospital. They run very little risk of contracting the disease so long as the hospital is not infected.

So far as military bodies are concerned, yellow fever is the most easily eradicated of all diseases to which troops are subject.

If, in spite of careful hygiene and quarantine, the command becomes infected, move. I do not think that a military surgeon serving in a yellow fever latitude can have too strongly impressed upon him the fact that in dealing with this disease among troops the all important measure is deportation. Do not defer it. The first case that originates in the camp or barrack, move. Do not attempt to get rid of it by disinfection or cleaning up, or wait for a second or third case. And then do not be alarmed if cases occur in the camp within the first five days. They were cases incubating at the time of moving. If any occur after the fifth day, I would advise moving again.

XXVII. PRACTICAL OBSERVATIONS UPON YELLOW FEVER, OR BLACK VOMIT, COLLECTED IN THE CITY OF VERA CRUZ.

BY LIEUT.-COR. ZACARIAS R. MOLINA, C. M. M. M.¹

PRELIMINARY OBSERVATIONS.

IN 1519, the "Rich City of Vera Cruz" was established, about ten miles from Zempoala, the principal village of the "Totonacos" (an Indian tribe); three years after, the "Rich City" was abandoned and the Spaniards established another town to the South, which place has retained to the present time the name of "La Antigua." Toward the end of the 16th. century, the foundations of the new Vera Cruz were laid on the beach of Chalchihuacan, opposite the rocky island of San Juan de Ulua, and in the same place where Cortez landed on the 21st. of April, 1519.

Clavigero and other authors affirm that the "vomito negro," or yellow fever, had its first appearance in this vicinity in 1725, but this is not in accordance with the tradition of the inhabitants of Vera Cruz.

Vera Cruz and La Antigua were abandoned one after the other on account of the disease, to which all Europeans were subject.

I do not pretend to write a history of the yellow fever from its first appearance in this place, which would be a fruitless task, since I do not consider myself competent, nor are positive data of any kind in existence; but it can, by comparison of facts, be inferred that the first appearance of the fever took place at a time when 300 to 400 people not accustomed to the climate were residing in the place. To corroborate this opinion I will quote some recent facts, though they were not noticed, because they passed in a new town of no importance. On the bank of the river Tecolutla, about six miles from the seashore, is located the town of Gutierrez Zamorra, which some four years ago was only an insignificant farm settlement. In 1874, its population could not have been over 50, but owing to the extending vanilla

¹ Dedicated to my distinguished friends, Dr. Ignacio Pombo and Lic. Louis Pombo, as proof of my respect and kind regard.

THE AUTHOR.

culture and wood cutting, it soon rose to 400 souls. In 1876, this place was suffering for the first time from a yellow fever epidemic, driving away the larger part of its foreign population. Then three years passed without a single case of the disease, promoting a new rise of the population, but it was a second time invaded in 1878. It should be borne in mind that said place has little or no communication with Vera Cruz, the principal seat of the fever, and that the epidemic developed there the first time when Vera Cruz was nearly free of the fever; and the second epidemic when the disease was making its usual ravages among her inhabitants here, as shown in table No. 1, subjoined to this treatise. Such is the history of all the places on our coast, whose growth naturally has to be slow, unless time develops so great a financial interest as to relegate the dread of yellow fever to the background, and bring a sufficient emigration of new-comers to replace the losses caused by tropical diseases, which, as a rule, are considerable.

The city of Philadelphia, although situated in the Temperate Zone, and nearly outside of the influence of the yellow fever, hardly seventeen years after her foundation, with scarcely one thousand inhabitants, suffered an invasion of the disease which nearly destroyed the young colony.

Vera Cruz lies in the tropics, and is one of the few localities where yellow fever exists endemically, and I presume that the attempt to preserve life by fleeing from infected places is the reason that the early inhabitants deserted one village after the other. I think from the facts mentioned, it is safe to presume that what occurred in Philadelphia, and in the new town of Gutierrez Zamorra, also occurred during the early years of the existence of this heroic city.

The form in which the disease appears, and its course, in a place like Vera Cruz, where it is considered endemic, is very peculiar. It disappears for months in some years, especially during Winter, yet at the end of the year the statistics always show a few cases. Evidently it is irregular, since in some years it assumes a very mild form, but in others, it is very severe, as can be seen in the subjoined table No. 1.

The years 1867, '68, '69, '70, '76 and '79 show such a limited number of fatal cases, that the residents of this city thought that

the fever had entirely disappeared. Yet, when in years like 1868, '71, '72, '73, '75, '77, '78 and '81 (see the same table referred to above), as a general rule, during the month of January, some deaths from yellow fever were observed, the dread caused by the appearance of the first signs of an epidemic in the summer time is such that the larger part of the population is liable to become the easy victim of the first quack who presents himself, pretending to be able to cure the disease, confidently taking any kind of mixtures recommended as infallible. It is rare to find one inhabitant of this city who does not possess a sure cure for the fever. The domestic medicines of the greatest reputation among all classes of society in this country consist of a glass of Castor oil, with a good dose of salt and lemon juice, clysters of "Palo Mulato" (an indigenous plant), or seawater and cataplasms of rotten mire, etc. All have their advocates.

At the beginning of July, 1868, I arrived in the city of Vera Cruz as Chief Physician of the Sanitary Section of General Ignacio Alatorre's Division. The greatest sense of security had then taken possession of the residents of this city, under the general belief that the fever had entirely disappeared on account of the introduction of new water works. It cannot be denied that this improvement is of the greatest importance to the city, and does honor to the active and advanced mind of the Mayor, Mr. Domingo Burea. The sanitary conditions of the town could not be more desirable during the following years, as the subjoined table shows, but if we look at the first six months of '67, and take into account such important testimony as that of Drs. Ignacio Pombo, Diaz Fernandez and others, we shall find that during a prior period the disease could not have been milder.

It is of interest to note the intermission recorded in the columns of the statistics for the succeeding years until '81—one or two years mild; two or three years severe. This intermission has its origin in two causes (which were observed many years ago by experts in the West Indies, Philadelphia and Vera Cruz); first the advent of people not acclimated, and, second, the prevalence of South winds, together with long and excessive heat. In order to prove my assertion, I have thought it convenient to form a comparative statistical table of the past five years, embracing

the prevailing winds, medium temperature, estimated population, and death-rate of yellow fever.

I regret that for lack of reliable information, it was impossible to include the hygrometric statistics and electric tension of this locality.

Dr. Ignacio Pombo found, after a short period of experience in this city, that the occurrence of deaths in the month of January was a sure prognostic of a fatal summer to non-acclimated people. The statistics demonstrate that such is the rule, with only two exceptions—the years of '67 and '77, when this terrible disease did not appear until the second half of the year.

In Vera Cruz the fever is endemic, hence it will invade and develop in any of the towns and places of our Atlantic coast and inside a limit of 1,000 meters above sea-level. The causes to which its origin is attributed are these: A rise in the temperature to 24° C., in the shade, for at least one month, preponderance of the winds from the South, forming (as we may call it for convenience) the "Yellow Fever Medical" constitution and the advent of non-acclimated people.

IS IT CONTAGIOUS AND CONVEYABLE?

It is impossible to affirm positively whether or not the disease is contagious, so long as the primary cause has not been demonstrated which produces this plague.

The very interesting microscopic investigations of Dr. Carmona, Professor in the National Medical College, reflects credit upon our National Medical Faculty and promises a boon to humanity in general. It is very much to be regretted that this distinguished professor is not an immune, to permit his coming to Vera Cruz during the proper season, as he would find here all the desirable material to complete his interesting work.

For the present it is of no use that he discovered the microbic fungus, *Peronospora lutea*, that he classified it, that he even believes that the yellow color which gives the name to the disease, is due to the decaying zoosporic cells; so long as it cannot be demonstrated that these bodies are capable of producing the evil. Meantime, no substance has been discovered, in the chemical laboratory or in the human body, with the power to destroy or neutralize it.

Great was my regret when I read an article from Professor Carmona in the "Escuela de Medicina" of the 1st. of January, 1882, in which he fully denies the sanguineous origin of the melanic vomits of the yellow fever. I am perfectly convinced that, had the learned doctor exercised his profession in summer time in Vera Cruz, he would never have published in the columns of a newspaper such an erroneous opinion.

There is such a difference of opinion about the conveyance and infectious nature of the suspicious matter, which is able to produce yellow fever, that it is safe to presume that any one of all may be right, because it has but one persistent origin. I shall limit myself to cite facts that have come under my observation during fourteen years of experience in this port.

As can be seen in the statistical table No. 1, in '75, Vera Cruz suffered so severely that non-immunes were compelled to seek shelter in towns like Orizaba, Jalapa, Paso de Ovejas, etc., until the ravages of the disease calmed down. During the following year only 34 fatal cases were due to yellow fever. Yet, while we were enjoying a period of peace, Cordoba, Paso de Ovejas and other towns were the theatre of a multitude of deaths caused by this malignant disease.

Again, the same thing happened in '78 and '79, during which period Vera Cruz was relatively free from fever, 21 deaths in one year being very little as compared with previous years, especially that of '71.

Though it is a fact that Vera Cruz is in constant communication with Tampico, Progreso, Campeche, Lagunas, Frontera, etc., yet the disease may break out when least expected in any of these places. In March, April and May, '68, the division of General Alatorre was stationed at Merida, Yucatan, composed entirely of people from the interior of the Republic, yet not a single case was observed; meantime, a small detachment under the command of General Cepeda, and composed of men from the interior of the Peninsula, was suffering most severely from the terrible assaults of the fever, dying from two to three every week in the local hospital. Notwithstanding the constant communication between the men of the two detachments, not a single case of contagion was observed. If I was not afraid to weary the reader, I could cite many cases like the following: Ignés Villegas, a na-

tive of Jalacingo, and 40 years of age, entered the hospital in April, '81, for the performance of an operation for a cyst on his left eyebrow. After the operation an erysipelas supervened (in the face and upon the head), which put his life in jeopardy; but on July 15th. he was discharged, healthy and strong. During his stay in the hospital he was surrounded by cases of yellow fever, but suffered no contagion. Yet, on the 28th. of the same month, while in his quarters in the barracks, he was seized by the fever and returned to the hospital the third day after being attacked. My prognosis was of the worst, as I had not for a moment any hope that he could be saved. He died on the third day after his entry in the hospital, presenting all the dreadful symptoms which I will describe further on, in treating of the Symptomatology of the Yellow Fever. I think, however, that this case will be sufficient to demonstrate that the element which produces the vomit, whether it is called micro- or zoosporic, is neither contagious nor to be conveyed, and when this happens, it is through causes entirely unknown up to date.

CLIMATOLOGICAL CAUSES, BELIEVED TO GIVE ORIGIN TO THE
PROPAGATION OF YELLOW FEVER.

Various authors I have consulted and find all of the same opinion about the propagation of the yellow fever. They say, that in Vera Cruz the fever does not commence to make its ravages until the medium temperature reaches 24° C. and the South-east breezes, which are common from March to September, predominate on our coast; the rains in June, July, August and September also have their influence upon the development of the disease.

During the time of my residence in this city, though I do not possess exact data to confirm it, I have observed that tempestuous rains indicate, as a rule, that if the fever should appear, it will only be in a mild form. To support my assertion, a look at the statistical table No. 2 of the columns for the years '69, '70, '76 and '79 will prove it. Those years were very wet periods.

To be true to my plan of stating facts only, to enable the readers to form their own opinion, I have compiled statistical table No. 2, comprising the medium temperature, prevailing winds and death-rate. It will show the basis upon which scientific men

gave their judgment, and the truth contained in the opinion of the common people.

Though I endorse the same opinion, yet I am not satisfied, since there still are other pathogenic causes for the fever, which have as yet not been discovered. See table for '78—Medium temperature, 20° C. +; prevailing winds, Northwest and North; death-rate, 10. For January, '79—Medium temperature, 20° C. +; prevailing winds, Northwest to Southwest; death-rate, 6. This seeming contradiction has its logical explanation. The beginning of '81 was still under the influence of the epidemic, which commenced at the end of August of the previous year. See statistics referred to—Medium temperature, of December, '80, was 23° C. +. The corresponding column for January, '81, gives a medium temperature of 19° C. +; winds, Northwest; death-rate, 18. In January, '80, medium temperature, 23° C. +; prevailing winds, Northwest to Southeast, with no predomination of either; death-rate only 2.

By the foregoing I think I have proved that the temperature as well as the winds can be considered powerful pathogenic elements of the severity of the fever.

On careful examination of the statistics one will find that even in years of an epidemic, the death-rate from January to May does not amount to much if the North winds prevail, although the medium temperature is high. This will become so much more notable, considering the increased advent of foreign and non-immune people during said period, as compared with the rest of the year.

From the foregoing may be deduced that a high temperature alone is not so noxious as if accompanied by Southeast winds. Breezes from the Northeast very considerably modify the local sanitary conditions. It is also supposed that the defective public hygiene contributes to the presence of the fever, but this reason does not exist, as, in my opinion, few towns have authorities more zealous in the discharge of their duties. The sanitary regulations in force in Vera Cruz are complied with regularly. Twice every day, cars collect the waste and garbage of the residences. Through the open sewerage of the city, plenty of clean water is flooded three or four times a day to wash even into the sea all organic matter they may contain, and yet, notwithstanding, we

are afflicted most severely by the terrible disease in some years and treated mildly in others.

I have no doubt but what a good sewerage system, connecting all the cesspools and private gutters of every residence, would improve the at present entirely neglected private hygiene a hundred per cent. The tenement houses and ground-floor residences are, for the majority, constant breeding places of consumption and lung troubles, because of their underground being naturally saturated with the liquids from the cesspools, and because they are destitute of the two principal elements of organic life, light and ventilation. It may be that these together have some indirect pathogenic influence upon the yellow fever.

The intention of this small work does not allow me to enter into more details, but I believe, from the facts stated, it can be assumed that whenever the temperature rises above 24° C., together with prevailing South winds and relative absence of rains with electrical discharges, the fever will, as a rule, appear; and the advent of non-immune people will give the same epidemic character.

Before I treat of the practical symptomatology, I will mention a strange fact, known even to the laity.

In the beginning of March, 1871, appeared in this city a real epidemic form of catarrhal affection, with all the characteristic symptoms of influenza. Toward the middle of the month, the yellow fever appeared in rather severe form. The same phenomenon has been observed during all the succeeding years, from two weeks to one month previous to the epidemic.

The change of season could not have been the cause, as many supposed, because in '79, when everyone was glad of having another good year like the foregoing (in which only few cases had occurred), the epidemic appeared in August, but previously nearly everyone had suffered from the same catarrhal affection, the influenza. The fear of being taken by my colleagues for an ignorant quack prevented my predicting the approach of the epidemic.

INDIVIDUAL CAUSES AND PREDISPOSITION.

Excess in sensual pleasures, want of sleep, or being up until late at night and exposure to the night air are very dangerous. To be exposed to the rigor of the sun's rays, as is the case with

soldiers and prisoners; the first in compliance with military discipline, and the second in compliance with the punishment imposed by law, is of the greatest influence in predisposing to the fever. The afflicting emotions of the mind, such as fear, sorrow, grief, etc., are likewise of great influence. It may also happen that an individual is not assailed by the fever for four or five years, yet at any moment and from the most trivial cause he may be taken ill and succumb to the disease.

PRINCIPAL SYMPTOMS OF THE EPHEMERAL FORM.

It commences with shivering, light but annoying pain of the body, more intense in the hips and calves of the legs. The next stage is headache, dry and hot skin, accelerated respiration, face lightly red-colored, the eyes reddened and weeping, the conjunctivæ lightly injected, the same with the gums, the tongue moist and a little coated, and the patient usually complains of thirst. The pulse fluctuates between 88 and 100 beats to the minute. Applying the thermometer in the axilla for three minutes will show 38° C., or 38.5° C., or a little more, but seldom to 39° C. At the beginning of the disease the urine will show no departure from normal. These symptoms will continue for from 36 to 72 hours. The sick man will feel tolerably well, desires to eat, and if a business man, will want to attend to his occupation. In this form, the albuminuria appears at the commencement of the convalescence. The above-described type is the prevailing one in periods when the fever appears in mild form, but frequently also during an epidemic. In years with mild forms it is mistaken for common malarial fever, but which does not protect from the true yellow fever. In periods of an epidemic nearly all febrile affections show icterus, although lightly, toward the end of the sickness, which is a very serious source of error.

It would not be prudent to declare it yellow fever in the absence of albumen. These fevers, which easily disappear by nature's own efforts, are the ones so successfully cured by amateurs, by prescribing the traditional dose of oil with lemon, clysters of "Palo Mulato," and little pills by homeopaths. All of them believe that they perform wonderful cures, mistaking the action of Nature through ignorance.

I wish I could give a classification of the fever, similar to the one adopted by famous physicians in regard to other epi-

demics in Europe, America and the West Indies, but I do not feel myself competent nor with sufficient authority to undertake such work. But I will say, that any classification must necessarily be arbitrary, and in accordance with the opinion and appreciation of each one. Hence, I will confine myself to describe symptoms just as I have experienced them in this town. I am satisfied that the fevers described above, as well as the cases of yellow fever I am to mention further on, have the same source of origin, with the difference that persons attacked by the latter will be exempt from a second attack in subsequent epidemics. Further on I will mention a few cases, which, though exceptional, are not void of practical utility. The one to be mentioned is of so much more interest, because of recent date, and in a person well known by competent men like Dr. Ignacio Pombo, who treated him in his first attack, and Dr. Alfredo Velasco and the writer in the second one.

It is the case of Enrique Gil, the entering clerk of the Military Hospital, who had the fever in August, '72; since then he has rarely been absent from his post, and then only in connection with his duty. He was constantly in contact with all sick of yellow fever, and in good health, until '81, in July, when he was taken seriously sick, presenting all the symptoms of yellow fever of such strength as to leave no doubt in the mind of the attending Dr. Valasco and the writer. This case is of interest, because, after an interval of eight years passed in a constant focus, as surely a hospital can be considered, he suffered a relapse. I have observed three more cases like the above and could give all the details, but deem it unnecessary.

ENDEMIC YELLOW FEVER.

We call the disease by that name in following the order of gravity, and consider it to be the prevailing form in periods when the death-rate is at its minimum, as for instance, in the years of 1869, '70, '76 and '79. The symptoms are the same as in the ephemeral, only with increased intensity of headache, and of the pain in the hips and legs. The temperature of the body varies between 38.5° C. and 39° C., from the first to the third day. Pulsation from 100 to 112. The red injection of the eyes changes during the time of the fever into the characteristic icterus in time of

convalescence (apyrexia period.) At this time albumen appears in the urine. The cloudy flocks which are caused by the nitric acid when falling in the tube containing the urine to be analyzed, are of light pearl color, but very abundant and thick in cases of more gravity. The nausea will also sometimes appear, being a very important symptom in cases I will describe. Appearing in this form, it is easy to overcome. The patient will be in full convalescence from the fourth to the seventh day, and the treatment is the simple one of expectation, symptomatic as well as dietetic. The organic functions are sufficient to suppress the disease and re-establish the physiological equilibrium. Should the case end fatally, it is always due to the suppression of the urine, the consequence of the disturbance of the kidneys.

To give an exact idea of the forms most prevailing which I have witnessed in the different epidemics, I will make reference to a few practical data collected since the first day of invasion.

On the 1st. of October, 1881, I was called to see a young woman, a native of Jalapa, 17 years of age and of a sanguinobilious disposition. Twelve hours after having been attacked by the fever, a febrile movement of 39.5° C. was in progress, pulse 112, aspect of the face, high colored, strong injection of the eyes, as well as of the lips and gums. She was complaining of severe headache and pain in the whole body, but more in the loins and calves of the legs. The skin burning and dry to touch; urine little more colored, but of normal quantity, tested by nitric acid, free from albumen.

First Day. Treatment of this day—Effervescent salt of seltzer, preparation of Tarrant, 30 gm., divided in eight powders, one every two hours in a glass of sweetened water. I use this preparation, because it is pleasing to the taste and has the action of a saline purge and the advantage of developing carbonic acid, which calms the natural irritation to which the mucosa of the stomach is subject in this disease.

Second Day. The general condition shows prostration, the patient being unable to sit up in bed, being obliged by the nausea to keep in a horizontal position. Her temperature reached 40.8° C., pulse without variation, 112; the injection of the eyes showing a light icteric color; gums, more highly colored; headache described as more intense. The urine very high colored,

scanty in quantity and showing signs of albumen. The treatment of this day was two baths of a temperature pleasing to the patient; as many as eight, or even more papers of fifteen cgm. of nitrate of potash, dissolved in half a glass of lemonade (lemons or oranges). She preferred oranges.

My only object in prescribing nitrate of potash was to reduce the action of the heart and indirectly to promote diuresis.

Third Day. The general condition still more prostrated. The icteric color more pronounced. Temperature, 40.5° C., pulse without variation. The production of urine did not reach 120 gm., was turbid and full of sediment, which, when filtered and heated, coagulated on adding nitric acid, and proved to contain albumen after standing for eight hours. Two-thirds of the urine of the morning was analyzed. The treatment of this day was as follows: Dig. Tinct., 2.50 gm.; Brom. of pot., 1.00 gm.; water or "Jarabe" (syrup), ad 125. gm.; a spoonful every two hours. Toward the evening of this day the patient felt the pain in the loins and epigastric region more intensely. In the majority of cases the patient does not feel these pains until the third day, except in severe cases, which develop with such rapidity as seldom to survive the fifth day. Treatment of the afternoon: Bathing in warm water for 20 minutes and a revulsive upon the aching regions. The revulsive I use consists of turpentine oil, 30 gm.; camphoric alcohol, 30 gm.; acetic acid, med., 1.00 gm. It is applied with a rag to the aching parts of the body. I have adopted this formula as being just as good as any other, yet cheap, easily applied and very clean.

Fourth Day. This day the symptoms were quite different from the previous day, the temperature had fallen to 36.5° C., the pulse 100, and was compressible and soft. The icterus was at its height of intensity. The weakness was so great that she was not able to sit up in bed without help. The urine, though full of albumen, was abundant and free from cloudiness. The increase of this secretion made me more hopeful, but what alarmed me was the nausea (slimy spit), containing many of those spots we call in our language "wings of flies," which is the preamble of the black vomit. Treatment of the day: Brom. of pot., 1.00 gm.; Syrup. simpl., 30.00 gm.; one small spoonful every two hours. Little pieces of ice in the mouth to calm the nausea, and

all the drinks desired and sweetened to the taste of the patient. Complete abstinence from food.

Fifth Day. The general aspect of the patient on this day was very encouraging and her features were animated. Temperature, 39° C.; pulse, 100. Light hemorrhage through the mouth and little nausea. The same treatment as the day before.

Sixth Day. The night passed well with good sleep, all her symptoms indicated to me an improvement. She had some appetite. Temperature, 38.5° C.; pulse, 90. The bleeding of the mouth had ceased. The tongue very little coated. The quantity of the urine could be considered normal, of a darkish color and containing abundant albumen. This day, for the first time, she was allowed to take a little sago, three times during the day, and water of normal temperature.

Seventh Day. The sago given the day before had proved to agree with her so well that she desired an increase of the quantity, yet, I took great care not to please her. Her movements were animated, though she could as yet not sit up in bed without help. Temperature, 38° C.; pulse, 85; tongue natural; urine dark and yellow and in normal quantity. She got four cups of light sago for nourishment and no medicine was administered.

Eighth Day. Her condition this day was very encouraging. Temperature down to 37.5° C.; pulse, 80. She was hungry and desired to eat, but following the judicious practice of Dr. Pombo, I abstained from complying with her petition, only permitting broth to be given her, and if her stomach proved strong enough for that, to let her have broth of chicken tomorrow or the next day.

Ninth Day. Temperature and pulse again normal today and her features full of animation. Her stomach had supported the broth of the day before very well, hence I allowed her to eat as I had promised her. From that day on, convalescence rapidly progressed. Six days after, albumen was still found in the urine.

The course of this case is the most perfect type I have had an opportunity of observing from the very beginning, because, as a rule, the aid of a physician is called but the third or fourth day after the invasion of the fever.

In continuation, I will give 91 cases of similar character as the foregoing, with annotations of the length of time of residence

in this city, the days of sickness before entering the hospital, the symptoms in the more severe cases, and some of the complications I believe to be of some practical interest:

Residence of from 1 to 8 days.....	5 cases.
Residence of from 1 to 2 months.....	29 cases.
Residence of from 2 months to 1 year....	42 cases.
Residence of from 1 to 3 years.....	9 cases.
Residence of from 3 to 6 years.....	4 cases.
Residence of 12 years.....	1 case.
And one case from Atoyac.....	1 case.

Total 91 cases.

Entered on the day of invasion.....	25 cases.
Entered on the second day of attack....	11 cases.
Entered on the third day of attack.....	17 cases.
Entered on the fourth day of attack....	10 cases.
Entered on the fifth day of attack.....	15 cases.
Entered on the sixth day of attack.....	5 cases.
Entered on the seventh day of attack...	3 cases.
And on the eighth day, which is already the period of convalescence.....	5 cases.

Total 91 cases.

Among these 91 cases there were 83 in which the temperature kept fluctuating between 37.5° C. and 40° C. and the pulse between 100 and 112 in the minute, declining gradually until convalescence set in, just as in the case of the young woman from Jalapa.

In the rest of the cases the course was mild, yet well characterized. Albumen was observed in every case, the quantity according to the severeness of the attack. Black matter was thrown out in 30 cases. Petec' æ (spots upon the skin similar to those of typhoid fever) were observed in eight cases. Hiccough, a symptom of great severity, in three cases only.

COMPLICATIONS. Three cases had parotiditis (mumps), ending by suppuration. Two had discrete smallpox, one pneumonia and one basilar meningitis, from which a convergent cross-eye was retained, a clear proof of the complication.

The foregoing shows that 76 to 90 per cent. of people are attacked inside a period of one year residence in this locality, and

the rest after an indefinite lapse of time. This plainly proves that yellow fever is neither contagious, in the strict meaning of the word, nor infectious; and in order not to make a mistake, one should always bear in mind the individual susceptibility in the human species.

The anatomic lesions observed in 50 post mortems, performed and registered with some care, from 1870 up to the 17th. of March, 1882, are more or less the same as observed in an autopsy performed on the 18th. of March, 1882, in the Civil Hospital for Women and Children, called "Loreto."

Juana Suarez, 36 years of age, a native of Acayucan, an inland town to the south of Vera Cruz, single and a corn grinder by occupation, with six years of residence in this city, was taken severely ill with the fever. She was brought to the hospital five days after she was attacked. Her condition indicated complete prostration, she being in a subcomatose and delirious state, and not able to talk. Injections of the eyes red, tinted with yellow. Gums red, tongue dry like typhoid. Temperature of the body, 38.8° C.; pulse, 112, and compressible. The fingers of both hands contracted, the thumb between the index and forefinger. Treatment: Salts of Rochelle, 45.00 gm.; nitrate of potash, 1.00 gm.; water, 100.00 gm., divided in three portions, one every hour. Ice on the head and lemonade for drink. Complete abstinence from food. Second day after entering the hospital—general aspect, a little improved. The mind clear and patient able to tell the story of the beginning. Icterus of the eyes more pronounced. The temperature had gone down to 38.5° C., and the pulse to 100. She had not urinated, and on catheterization passed about 60 grams. The color of the secretion was natural, but the analysis showed plenty of albumen. The contraction of the fingers had disappeared, but the nausea was the same as on the previous day, vomiting a yellow liquid full of mucus. She claimed to be hungry, and two small cups of common sago were allowed her to take every quarter of an hour rather for local emollient. Treatment: The same as the day before, revulsion upon the epigastrium and clysters of laudanum with quinine, three, at intervals of a quarter of an hour, according to the following prescription: Laudanum, gm., 1.00; Sulph. of Quin., 1.00 gm.; Aqua, 90.00 gm., divided in three portions. In the afternoon of the second day a certain im-

provement seemed to set in. She had not urinated, and on percussing the region of the bladder it was found to be empty.

She passed the following night very badly and her appearance indicated that all attempts to improve her condition would be fruitless. The subnormal temperature was 36° C., the radial pulse, filiform. Respiration difficult and a light labial cyanosis visible. She again had fallen into the same state of insensibility as when first brought to the hospital, but this time of increased intensity. Though I had lost all hope to save her, I complied only with the obligation imposed upon our profession to assist the sick to the last moment. I prescribed for her some stimulating rubbing and clysters. As I found that it was impossible for her to swallow, I abstained from the administration of any medicine. In spite of all efforts to the contrary, at midnight death put an end to her sufferings. Ten hours after she died rigor mortis was complete, the body tinted in several parts with violet spots, more pronounced in the lower parts. Performing the autopsy, the liver was found to be of a color like coffee with milk, the gall-bladder to contain a dirty yellow colored liquid without the consistency of the gall. The kidneys a little softened and much congested. In the same condition was found the stomach, small intestines and the colon. The inside of these organs were covered with the characteristic black substance of the disease.

Cases like this are observed quite frequently in which no black vomit is ejected during life time, but whenever doubt induced me to perform an autopsy, I have found internally the same substance in more or less quantity. There was no urine in the bladder. The lungs were also congested, presenting a state of hepatization. On opening the skull, it was found that the meninges were full of blood, a light subarachnoid cerebral effusion. In dividing the brain, the cut became tinted red, as in cerebritis, but without the softening, by which that is accompanied. All the smooth fibrous textures were yellowish colored, as in the sclerotics and the skin of all attacked by this disease.

Dr. Daniel Ruiz and myself performed once an autopsy on the corpse of a soldier from the fort of San Juan Ulúa, who had died of yellow fever. His name was Antonio Mendez, a native of the capital, 25 years of age, of a strong constitution and of In-

dian race. He died with symptoms of asphyxia on the seventh day of the attack. The anatomic lesions met with in this case were similar to those of Juana Suarez, with the addition that the cerebral alterations were more pronounced in the latter, and the hepatic in Antonio. If it is allowed a physician to draw conclusions from phenomena in diseases, it should be well permitted in this case, inasmuch as the agent causing so many anatomic alterations has not as yet been satisfactorily demonstrated. Supposing the microscopic cryptogam of Professor Carmona to be the cause of the yellow fever, how can the great variety of pathologic manifestations be explained?

In some cases the disease begins with a kind of "prostration" of all the physical strength of the organism, and from the first day the physician feels himself overpowered by the force of such a terrible disease. In other cases, the hepatic disorder is predominating, accompanied by sanguineous extravasation of the digestive apparatus in its entire tract and of the meninges, lungs and connective tissues. It is not to be denied that the poison, whatever may be its origin, attacks first direct the great sympathetic nerves.

I am inclined to believe this hypothesis, on account of the acute degeneration of the liver and the complete paralysis of its assimilative function, and of the great development of caloric, which destroys life.

The sanguineous extravasation of the viscera and connective tissue, does it not, also, indicate that there is a serious alteration of the innervation? The more or less regular appearance of the icterus explains itself to me by the perversion of the alimentary or digestive functions, already referred to, of the liver. I hope that with time the microscope, aided by organic chemistry, will clear up this pathologic problem, but our last hope is in bacteriology.

DIAGNOSIS AND PROGNOSIS.

The diagnosis of yellow fever presents many difficulties, not only to the physician just arrived on the ground, but even to the more experienced, and those who have resided several years in the locality.

The picture of symptoms given by a multitude of worthy writers on internal pathology, and specialists, contains, in my

opinion, a too complete, or too diffuse, description. In the former, one finds the majority of cases mentioned in which the physician is called; in the latter, the neophyte physician becomes so confused that it is hard for him to abandon so much contradictory knowledge and form for himself a practical and independent opinion in the presence of the sick.

If a person to whom one is called, presents a flushed face, brilliant eyes, the skin burning to touch, the pulse accelerated and full, is complaining of great pain in the limbs, and of headache, of nausea on sitting up in bed; if, on questioning, it is found that the patient has resided less than one year in the locality, that it is the first time to be sick since his arrival in the place, and if this happens to occur in the time from April to August, the physician may diagnose with confidence that the patient is a victim of the yellow fever or "black vomit." If the temperature of the Centigrade thermometer, which is the one I have used in all my observations, marks 39.5° , and the pulse beats ten times per degree of the abnormal heat; that is, ten times per minute for every degree above 37° C., which is the normal temperature; if all this happens inside the first 24 hours of the invasion, one has to be very prudent in giving a prognosis. It is advisable to follow the course of the fever, by measuring the temperature, to observe the injection of the eyes and gums, and to look for albumen in the urinary secretion. The relative action is 100 to 112 pulsations corresponding to this temperature, 39.5° C. to 40° C. If the temperature rises to 40° C., the pulse persists in proportion, and if the temperature holds on for three days without declining, the red injection of the eyes is the same as on the first day, changing to yellow, no matter how lightly; if the urine becomes saturated with albumen, and among the vomit appear some black grumes, one can "*diagnose*" yellow fever, with serious alteration of the liver and kidneys, and predict more than 90 per cent. probabilities against his recovery and less than 10 per cent. in favor of the individual presenting this condition.

If these symptoms continue for four or five days, the disease, as a rule, will terminate fatally. It is a rare case that a patient, presenting the foregoing symptomatology, escapes death from the terrible disease, as proved by the following table of 83 cases, all ending fatally:

Entered between the first and second day of attack, vomiting the black substance.....	10 cases
Entered between the third and fourth day, same vomit as the foregoing.....	28 cases
Entered in the agony, and died the day of entry in the hospital	43 cases
Attacked in the hospital while there under treatment for other diseases	2 cases
Total	83 cases

Forty of these cases presented the symptoms mentioned above; of the rest, it was impossible to obtain any observations during life, as it can be said they died upon entering the hospital.

The best reagent to analyze the urine in suspicious cases of yellow fever, during the first two days of invasion, I have found to be the following: From a solution of chromic acid, of 5-100 per cent., drop by drop is let fall in a tube containing some urine. If the urine contains even an albuminous vestige, the reagent will go to the bottom, forming a track or path through the liquid. If free from albumen, the solution of the chromic acid will diffuse, imparting its color to the whole. With this reagent any albuminous trace will be discovered in cases of sudden and acute invasion, 24 hours before it could be found by heat or nitric acid, which are the reagents universally used. In my practice I make use of all three reagents, always commencing with chromic acid, and I have no recollection of the latter having failed me in a single case, to make a diagnosis of the disease in the first 48 hours of its invasion. Albumen in the urine at the onset of the fever is a fatal symptom.

Once in the habit of using it, one will find it a method which has the advantage of being sure, prompt and simple to operate. The method given by Dr. John McKowen and published in the "Journal of the Mississippi State Association," Vol. 3, No. 2, of May, '99, seems to me more scientific, but with the inconvenience of not being so easily applied in the sick-room as the one mentioned above.

DEATH-RATE.

Many have been the authors I have consulted to see if I could find some statistical data of mortality from yellow fever

in the city of Vera Cruz, but all my endeavors have been without success. All I have found is the small statistics of yellow fever in the great work of R. La Roche, taken from "Estudios sobre Nueva España del Baron de Humboldt." It says:

"Vera Cruz, 1803. Hospital "San Sebastian"; population, 16,000 to 17,000; cases of yellow fever, 428; death-rate, 69 per cent."

That year must have been memorable for this unhappy town.

Next it gives an average of one death for 6.23 cases, occurring in 15 years, or a rate of 16.66, without any other specification. I believe the insertion of the statistics showing the relative death-rate between both sexes to be of some use. (See Table No. 3, at the end of this paper.)

Those data have the one merit of having been collected in the Military Hospital of "San Carlos," and in the Hospital for Women and Children of "Our Lady of Loreto," in this city, by the author, who was in charge of the Medical Department in both establishments. At first sight one can see, by the quarterly form of the statistics, that the yellow fever never disappears completely in this city. In the seven years, only the first quarter of 1876 shows no cases of the disease in the hospitals mentioned. Taking the statistics in any way, the death-rate is somewhat larger in the male sex. In order to better understand the difference, I will give an explanation for the sake of the truth. In the statistics of the Military Hospital are included the cases of ephemeral fevers, by the Director, Dr. Manuel Garmendia, who directed or compiled it himself, yet he did not make this inclusion to improve the value of the statistics of the hospital, but because of the probability of their being of the same nature as said disease.

In the one for the hospital of "Loreto," all these fevers are excluded, even those from three to seven days duration, whose symptoms are mistaken for those of yellow fever, so much so, that the distinguished Dr. Ignacio Alvarado told me once that whenever albumen would appear in such fevers, he would not hesitate to declare it "Vomito," even in people from Vera Cruz.

I am convinced that in yellow fever, severe or mild, albumen will always be found in the urine, and those who die under the following symptoms: Fever movement, icterus, melanotic vomit,

hemorrhages of the mouth and gums, but without albumen in the urine, succumb to an attack of grave malaria, mentioned by physicians of the South of the United States; or what is the same, to an hemorrhagic remittent fever, which, fortunately, is tolerably rare in this city.

The few cases occurring, from time to time, are not of the same gravity as those reported to me from Tampico by Dr. Velasco, Director of the Military Hospital there.

I also think it proper to mention that the larger part of the men attacked by yellow fever in the Military Hospital, have been in my Department of said establishment, and have been treated by the same method universally adopted by physicians in hot climates. Said treatment consists of purges, acidulous drinks, cold applications to the head, during the period of reaction, astringent tonics against the hemorrhages, anti-emetics against the nausea, anti-spasmodics to combat the hiccough, and baths at normal temperature. Sometimes, among immunes, appears a fever very similar to yellow fever, and to illustrate my opinion of the non-identity of these cases, which so well simulate the "Vomito," I will describe a very recent case.

Josepha Sanchez, a girl of ten years of age, a native of this city and a pupil of the orphan asylum "Zamorra," commenced with fever on February 11, 1882; temperature 38.5° C.; pulse 100, to the minute, strong pain in the lower limbs and hips, headache injection and pain of the eyes, gums red, epigastric pains and nausea. The third day after the appearance of these symptoms, icterus appeared in the eyes and a strong passive-exudate hemorrhage from tongue and gums, which all extremely alarmed me. To overcome these symptoms, as well as the qualmishness which continued, I prescribed the following: Ext. fl. Ergot 1.00 gm., Sulph. acid. arom. Ph. A. 1.00 gm., Mur. of Morph. 0.05 gm., Syrup of Orange (Jarabe de azahares) 20.00 gm., Aqua 125.00 gm., a tablespoonful every two or three hours, to be taken during the ensuing twenty-four hours. From the beginning of her sickness up to her convalescence, I have analyzed the urine and have found no vestige of albumen.

This case, in time of an epidemic and happening to a person not from Vera Cruz, would surely have been declared to be yellow fever.

I did not want to include such cases in the statistics of the "Loreto" Hospital, because if I had, the difference in the death-rate between males and females would have been noted at once. For the same reason, it should be borne in mind that no deduction has been made of the forty sick which only entered to die, and that also a deduction of 23 per cent. in favor of the statistics for women can be made. Dr. Graves, in talking of yellow fever in his "Clinic," makes the statement, that the more robust a person is, the disease develops with so much more intensity.

I believe that to this circumstance and the one that women are not exposed, as a rule, to the same causes as men, it is due that the first suffer with less rigor from the ravages of the evil than the latter.

TREATMENT.

This is one of the diseases in which physicians in general exhaust their medical knowledge in the shortest time, if it happens that they have to begin their profession in a period like the year 1881; but, if at a time when the fever manifests itself in a mild form, then each one forms for himself a thousand different chimerical creeds or opinions, and imagines himself to be in possession of the very best method. These illusions will be dispelled during the next epidemic appearance of the disease.

True to my original intention, I will state a few more facts that have come under my personal observation.

The ephemeral yellow fever, which is the lightest type of endemic (yellow) fever, and in which the honest physician finds himself most compromised with his clients, as he cannot assure the sick with conviction of the result, not knowing whether or not the patient is acclimated, is cured by nature. All treatment is unnecessary, but the exaction of the one, and the personal interest of the other which everyone has with his fellow creatures, oblige the physician to do something. In fact, one has always something to do, even if it be only to calm the stomach from the irritation produced by the traditional oil with lemon, and the treatment by the people, whenever it is thought to be an attack of this evil.

Whenever the disease appears under the form I have just described as "endemic" (although as a rule it terminates favorably without any treatment), yet it is customary for the physician

to prescribe a saline purge. Some use citrate of magnesia, some sulphate of soda, and others castor oil. In the hospitals the sulphate or citrate of magnesia is the usual purge prescribed.

I have accustomed myself in the civil practice, to prescribe the prescription mentioned as "*Sale de la Rochela*," and nitrate of potash, or, in private practice, the effervescent aperitive of Seidlitz, for the reason mentioned, acid drinks, and abstinence from food during the period of the fever. When in the second stage of the fever, the epigastric pain and nausea appear, I then combat these symptoms with the same means known to all physicians, by revulsives against the pain and some potion of anti-emetic. The one most used is the one known as "*Potion of Riveiro or Rivier*." Generally the desired effect is obtained by employing this simple therapeutic measure.

If the urine is scanty and the albumen abundant, and it is feared that this important function be interrupted, then some employ dry cupping, but bromid of potassium has given me the desired result: One gram well dissolved and directed to be taken in twenty-four hours. Lukewarm baths also produce good effects in such cases.

TREATMENT OF THE EPIDEMIC FORM.

This is the dangerous point on which the best directed therapeutics are shattered. This is the "*Opprobium medicorum*." I think it is not outside the case to mention the clinical division, as I would call it, I have formed for myself in order to distinguish the two varieties which Codinach mentions by the name of "*Vomito ataxico*," and "*Vomito adinamico*," in his treatise on yellow fever, written and published in Habana in 1868. I frankly confess to have not been able to understand, nor have I found in practice, the symptomatology just as he describes it, in order to distinguish the one form from the other.

The division I want to mention, is based upon the course and symptoms observed and pathologic lessons to be noted or deduced from the symptoms. In the quicker course, which is the ataxic, it is observed that the hepatic lesions prevail, and in which occur, on entering the protracted period, the accidents of sanguineous extravasation, like the black vomit, melanotic diarrhea, pulmonary and meningeal congestion, etc.

In the longer and more insidious course, which is mistaken for grave remittent fever, one soon observes that the alteration of the kidneys predominates. In the first case, the temperature ascends the first day to 40.5° C., then goes down to 40° C. for three or four days. The icterus, yellow or ochre, and the albumen appear from the third or fourth day.

The treatment in these cases I direct against the principal symptom which is the abnormal development of heat (caloric). The theory I have formed myself is this: if the heat-producing agent (whatever its name) is most active during the hottest months and loses its energy with the cooling off of the temperature, my rule is to imitate nature, reducing the temperature of the focus which produces or sustains the heat, which in this case is the body of the attacked individual.

To attain my object with the least disturbance, I make use of full baths at a temperature pleasing to the patient, every two or three hours during the day according to the intensity of the case. I believe very cool baths, or wrapping in wet sheets, to be prejudicial on account of the agitation experienced by the nervous system on the sudden change produced by covering or wrapping the body in wet cloth. Also because of the reaction produced by cold water after the prostration from the heat.

This may be an illusion of my own, yet the following observations based upon thorough experience during a long period of time, convince me that the treatment is rational:

In the epidemic of 1877, cases apparently of the severest type, were treated in this way. At the same time I was employing the system above referred to, I treated a number of cases according to the current method, and I always observed with satisfaction that the results were more favorable, though not infallible, in the former than in the latter. If the treatment were my own invention, perhaps self-love might make me see things different from what they really are. I wish my fellow-physicians would, without any pre-conceived notions, decide to put in practice the system I have indicated, in order to arrive at a practical conclusion on what has seemed to me to be a fact of some importance. I do not pretend to impress on the mind of anybody that this treatment is better than any other; I only wish to comply with an indication in accordance with the general principles of medicine.

This treatment, with proper precaution, has the advantage of being desired even by the sick, because of the pleasing comfort experienced by them.

In these two forms, the nausea is a constant symptom annoying to, and exhausting the strength of, the sick. Besides, it has to be borne in mind that this symptom is an obstacle to be overcome by the physician, in order to administer the medicines mentioned. When the urine diminishes considerably and the presence of albumen is observed, it is a sure sign that the kidneys are seriously affected, and it is of the utmost necessity to help their function in a way compatible with the state of the stomach. In such cases, I have had the baths applied as mentioned and they have always seemed to me to produce an increase and change of color in the urine. This makes me think that the baths work as a diuretic, be it in relaxing the arterial tension, or from the absorption of the water by the body during the immersion, and subsequent elimination through the kidneys. This fact I have observed even in cases, in which, in spite of the apparent improvement, I was sure of a fatal end. Though universally recommended, and in general use as a therapeutic agent to combat the vomit, I am fully convinced that blisters upon the epigastrium are useless in yellow fever with predominating hepatic lesions, and I am inclined to believe that they cause an over-excitation of the nerves, which, in this instance, produces, if I may be allowed to so call it, an acute aggravation. I think I have obtained better results whenever I have used them, with the same object, in cases of "vomiting," but with predomination of kidney affection and prostration of the "innervation." In the first case, there exists an over-excitement of the nervous system; in the second, a prostration is observed. This apparent contradiction reminds me of the physiological action of cantharides upon the nervous system and thus would explain it. The treatment put in practice in the Hospital "Loreto" in 1877, was the following: From three to four baths daily, the water used of normal temperature of the months of April to September, for all those attacked by the fever whose abnormal temperature passed 39° C. until their temperature descended; for drinks, in one liter, lemonade, Nitrate of potash, 1.00 gm., Tinct. aconit., 1.00 gm., to be taken in twenty-four hours. In case of nausea, complete ab-

stinence from food. In the absence of said symptom and no other contraindicating circumstance present, the patient was allowed to take two to three cups of light sago per day. My distinguished friend and teacher, Dr. Ignacio Pombo, would not permit a patient to take anything except he was nearly in full convalescence, which rule I also have followed and had never any reason to repent.

When the nausea would not yield to the ordinary measures, it nearly always was overcome by hypodermic injections of one gm. of a 1 per cent. solution of muriate of morphia, once or twice a day. If the hemorrhages, which so much prevailed in that year, would not disappear by the use of local hemostatics, they always would by subcutaneous injections, like perchloride of iron, decoction of rhatany, Fl. Ext. of Ergot, prepared after the method of Ivon, one gm.; twice or three times a day, without experiencing any accident in thirty cases which were treated thus during said period. I have not abandoned this therapeutic medium, yet I have made no further observations regarding it, as I consider its value an established fact.

The hiccough is a symptom which has always confused me, and indicates great severity, as can be seen in the table of cases saved, in which only three are mentioned as having it.

I believe morphine by injections to be better than any other substance to combat this painful symptom. I think it is not necessary to enter again into details of the treatment, as I have given it before. It was, though, my desire to call attention to the symptoms most prominent and of the greatest gravity, to see this heroic therapeutics adopted, because, as a rule, none of our physicians put it in practice. Neither do I pretend it to be something newly discovered, or to possess greater advantages than any other treatment; I have only thought to comply with an indication which requires the greatest possible activity in view of the rapid course peculiar to this affection.

I concur in the opinion of the distinguished Professor Carmona y Valle, put forth in his last "*Clinica sobre fiebre amarilla*," that he believes it impossible to find any infallible remedy to eradicate the disease from our coasts.

In closing, I will explain the conclusions I have formed for my own guidance: The yellow fever, like any other specific

affection, has a natural course which it has to follow according to the activity of development in each individual. The treatment, no matter what, has no influence on its special course. The treatment must be rigorously symptomatic, even if it should be proved what Dr. Carmona assures us, that *Peronospora lutea* is the direct or specific cause of yellow fever, or "Vomito negro."

Death will always supervene whenever the liver and kidneys are so affected as not to be able to perform their functions, and as a physiological consequence, a kind of intoxication results "sui generis," on account of the non-removal of the excremental substances for want of regulating organs. In such case dissolution is inevitable.

If it be allowed to the physician to interpret what is going on in the organism; *i. e.*, the physiological functions of the glandular system, one can see in a clinical way that, whenever the functions of the kidneys are not impaired in such degree as to prevent assisting the liver, and further, whenever the liver has not suffered so much as to prevent the discharge of its function completely, no matter how serious the rest of the symptoms, which constitute the disease may be; it will be cured by the "*medicatrix naturæ*," properly aided by science, save in case of a cerebral or pulmonary complication.

The foregoing deductions are the result of observations like the following, which could be multiplied if necessary: In July, 1881, I had charge of the captain of a German vessel lying in this port. From the first day of invasion the captain presented all the symptoms of a severe case with predomination of hepatic lesions. The treatment had to be of the simplest kind, since aboard ship few materials are at hand. The period of reaction lasted three days and a half and the prostration four; entering into convalescence the eighth day after being attacked. The third day after the captain had been taken sick, four of the sailors of the vessel's crew were taken sick too. The type they presented was the form I have called "endemic." The form of their treatment was still simpler than that of the captain, consisting of purgative salt on the first day, ptisan of cremor, the following days, complete abstinence from food during the febrile period, the duration of which was three days.

In the tenement house "Guadelupe" I had occasion to see four more cases; three light and one severe. In the "Avenida de la Libertad" I also was called to visit four cases, of which two were vomiting the black substance and completely prostrated. The sanitary condition of these poor people could not be worse. Their habitation was a small room of wooden structure and the temperature suffocating. The bed consisted of a straw mat. The treatment I employed with these people would be equivalent to letting nature work her own way. The first day they had taken a purge of castor oil, clysters of "Palo mulato" and lemonade of cream of tartar, dissolved. Those cases of severe character I ordered to take a potion of wine with Fl. Ext. of Ergot, and current revulsives upon the epigastrium. I also gave instructions to be careful not to take much food, and they all were fortunate enough to have their health completely re-established.

It would be easy to fill volumes with cases like these, yet I think with those referred to, it is enough for my object, which is to convince the mind of those persons, who believe the yellow fever to be an entity, which needs a direct attack, that, in this disease more than in any other, the following aphorism should be borne in mind: "The physician is the servant of Nature."

So far I have not changed my way of thinking in regard to yellow fever.

In the month of July (11th.) of the present year and by superior order, I turned over into the charge of Dr. Baker, delegate of Dr. Doty, four cases of yellow fever, for making experiments with the curative serum, yet the result has been negative. One was a soldier of the ambulance, Lopez Veloz by name. He was subjected to the treatment with the serum. The course of the disease did not suffer any change. Eight injections were given to him, the first two at intervals of eight hours, and the others every twenty-four hours. The case terminated fatally the ninth day after invasion. In the second case, a soldier of the 23d. Battalion, M. Rodriguez by name, who was subjected to the treatment with the serum, the course of the disease was without any difference, the same as usual, and terminated with the re-establishment of his health after ten days of sickness. The initial fever movement of the soldier from the Ambulance Corps, which

lasted forty-eight hours, was as follows: The temperature, 40.4° C., pulse 114 to the minute, kept fluctuating between 38.8° C. and 39.4° C., pulse 88, 86, 82, until the third day. From the fourth day on the temperature was 39.4° C. in the morning, pulse 92; in the evening 38.6° C., pulse 98. Thus it went on without declining to the normal temperature until the day when he died.

In the case of M. Rodriguez the temperature was 39.5° C., until the third day, when it rose to 40° C. for the course of eighteen hours, from whence it fluctuated between 39.3° C. and 38.8° C. until the fourth day when it went down to 37.9° C. and 38.4° C., where it stayed until the seventh day to go down to normal, the patient at the same time entering into convalescence. The serum had no influence whatever on the course of the illness.

TABLE No. 1.
Showing number of deaths by years, in Vera Cruz, from 1867-1881.

Months.	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881
January.....	..	7	..	..	3	2	1	1	7	..	..	16	6	2	28
February .....	..	6	..	..	..	2	..	2	2	1	1	5	4	..	22
March.....	..	7	..	..	1	4	..	..	4	1	..	..	2	1	29
April.....	..	31	2	..	6	5	3	..	11	..	..	1	1	1	29
May.....	..	42	..	..	19	14	1	2	29	..	4	7	1	..	94
June .....	..	16	..	..	113	45	19	3	93	2	7	58	1	..	233
July.....	8	28	1	..	71	53	59	11	118	4	54	114	2	1	132
August.....	29	21	1	..	17	39	59	24	105	7	144	110	1	3	39
September	36	21	..	..	10	29	44	7	41	9	164	62	3	9	22
October.....	17	9	1	3	15	11	20	12	13	6	77	45	..	42	25
November	11	2	2	5	2	..	10	11	2	1	50	24	..	92	18
December	8	3	..	2	4	6	7	6	..	3	27	7	..	98	4
Totals.....	109	193	7	10	271	210	223	79	425	34	528	444	21	249	675

TABLE NO. 2.

	1877.				1878.				1879.				1880.				1881.			
	Temper- ature.	Winds.	Deaths.		Temper- ature.	Winds.	Deaths.		Temper- ature.	Winds.	Deaths.		Temper- ature.	Winds.	Deaths.		Temper- ature.	Winds.	Deaths.	
January.....	.....	.....	0	20.87°	nw-n.	16	22.76°	nw-se.	6	23.03°	nw-se.	2	19.33°	n-nw.	28		19.33°	n-nw.	28	
February.....	.....	.....	1	22.22°	n-nw.	5	22.65°	nw-n.	4	24.08°	n-se.	0	19.68°	n-se.	22		19.68°	n-se.	22	
March.....	.....	.....	0	24.30°	se-nw.	0	25.21°	nw-se.	2	25.60°	se-nw.	1	24.15°	se-n.	29		24.15°	se-n.	29	
April.....	.....	.....	0	26.89°	nw-se.	1	26.15°	se-nw.	1	27.15°	se-nw.	1	25.05°	se-n.	29		25.05°	se-n.	29	
May.....	.....	.....	4	29.04°	se-ne.	7	28.59°	se-nw.	1	29.40°	se-nw.	0	28.05°	se-s.	94		28.05°	se-s.	94	
June.....	.....	.....	7	30.49°	se-ne.	58	28.67°	nw-se.	1	30.25°	se-nw.	0	29.20°	se-s.	233		29.20°	se-s.	233	
July.....	.....	.....	54	29.78°	se-nw.	114	29.80°	se-nw.	2	30.92°	se-nw.	1	31.15°	se-s.	132		31.15°	se-s.	132	
August.....	29.85°	se-nw	144	29.23°	se-nw.	110	30.31°	nw-se.	1	30.10°	se-nw.	3	30.92°	se-nw.	39		30.92°	se-nw.	39	
September.....	29.21°	nw-se.	164	28.57°	nw-se.	62	27.08°	nw-n.	3	28.50°	nw-se.	9	29.06°	se-nw.	22		29.06°	se-nw.	22	
October.....	27.69°	se-nw.	77	27.33°	nw-se.	45	26.14°	nw-n.	0	25.30°	n-nw.	42	27.01°	n-nw.	25		27.01°	n-nw.	25	
November.....	25.67°	n-se.	50	25.15°	nw-se.	24	26.02°	nw-se.	0	24.87°	n-nw.	92	24.05°	n-nw.	18		24.05°	n-nw.	18	
December.....	22.67°	n-nw.	27	21.26°	nw-n.	7	23.05°	nw-n.	0	23.73°	n-se.	98	23.15°	n-nw.	4		23.15°	n-nw.	4	
Total.....			528			449			21			249			675					

Though the census of this city is not so exact as would be desirable, yet it is very approximate. In 1875, it was 15,865, which figures served as a base for 1876, '77 and '78. In 1879, it was 14,163; rising to 15,245 the following year. The census for 1881, which is the most exact, gives the population as 23,578, which is a very sudden increase. Those who have continually resided in this city have been able to note the steady growth of population since 1876.

TABLE No. 3.

Year.	Quarter.	Female Hospital.		Male Hospital.	
		Entered.	Died.	Entered.	Died.
1875.....	1st. Quarter.....	10	3	3	1
	2d. "	35	24	21	3
	3d. "	52	26	313	126
	4th. "	2	..	17	7
		99	53	354	137
1876.....	1st. Quarter.....	..	..	..	..
	2d. "	15	..	62	..
	3d. "	28	4	164	14
	4th. "	10	..	23	5
		53	4	249	19
1877.....	1st. Quarter....	2	1	2	..
	2d. "	13	1	..	..
	3d. "	139	62	255	138
	4th. "	33	12	110	79
		187	76	367	217
1878.....	1st. Quarter	7	3	16	12
	2d. "	20	12	90	35
	3d. "	70	36	309	120
	4th. "	10	4	79	51
		107	55	494	218
1879.....	1st. Quarter.....	4	2	7	5
	2d. "	8	1	2	2
	3d. "	21	..	7	3
	4th. "	2	..	1	..
		35	3	17	10
1880.....	1st. Quarter.....	2	1	..	..
	2d. "	3	..	..	..
	3d. "	6	1	1	1
	4th. "	63	31	144	59
		74	33	145	60
1881.....	1st. Quarter.....	75	5	112	44
	2d. "	99	41	195	86
	3d. "	39	22	79	54
	4th. "	21	6	37	9
		174	74	423	193

The total number of men entered was 2,049, of which 854 died. Death-rate, 41.78 per cent.

The total number of females entered was 729, of which 298 died. Death-rate, 41 per cent.

The population of Vera Cruz can approximately be calculated between 16,000 and a little over 23,000 for these seven years.

In the statistics given by La Roche, the death-rate of yellow fever in the tropics is 50 per cent.

In the period of seven years of the foregoing statistics, the death-rate was larger for females in three, and for males in four.

XXVIII. TENTAGE FOR TROPICAL SERVICE.

BY EDWARD L. MUNSON, M. A., M. D.,

CAPTAIN AND ASSISTANT SURGEON, U. S. A.

WITH the military occupancy of our new island acquisitions, the unsuitability for tropical climates of our regulation tentage, particularly that used for the shelter of the sick, became at once apparent. While not seriously defective when used under the conditions of weather and temperature for which they were originally designed, the several types of tent used in our service were all found to be intensely hot and close under the vertical sun and in the humid atmosphere of the tropics. With reference to the hospital tent these undesirable qualities appeared to be presumably due :

First. To the impingement of the direct solar rays upon the single thickness of canvas of the walls and sides.

Second. To the insufficient air-space and limited opportunity for the movement of air between the fly and roof of the tent.

Third. To the inadequate size and improper location of the openings for ventilation.

After some consideration, the writer, some months since, suggested the following changes in the regulation hospital tent, which, it was believed, would materially improve the latter for service in the Torrid Zone :

First. That the tent fly be enlarged two feet in length and four feet in width.

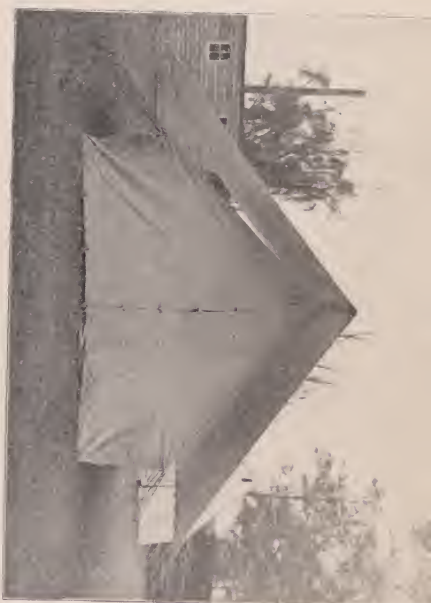
Second. That this fly be raised upon a light false ridge placed one foot above the true ridge ; this false ridge being four feet longer than the true ridge and projecting two feet to the front and rear. It was suggested that this be held in place by increasing by one foot the length of the present pins in the tent uprights and by providing two pieces of ordinary tent-pole, each one foot long, having a hole of sufficient size bored through its long diameter and strengthened at each end with a perforated iron plate to

prevent splitting. The false ridge is placed in position on these supports after the tent is pitched—the fly being then drawn over it and held in position by passing the projecting pins of the up-rights through suitably located eyelet holes.

Third. That the canvas comprising the top of the tent be cut out for a space two feet wide on each side of the ridge and running the entire length of the tent except one foot, front and rear. The canvas thus removed is replaced by strong rope netting, having a mesh about two inches square.

The above changes theoretically ensured complete protection of the walls—and nearly so of the ends—from the rays of the sun; a large free space, at least one foot wide, between the tent roof and fly, from which the heated air could be readily driven by perflation; and finally, complete ridge-ventilation of the tent itself, rendering the stagnation of hot or impure air impossible. The two foot overhang of the fly, front and rear, implied the pitching of the hospital ward in tent sections four feet apart, the sheltered intervening spaces allowing free lateral ventilation. The two flies are prevented from gaping by being slightly wider at the base than the centre and thus are readily made to overlap through the proper location and traction of the corner guy ropes. The tent-fly is made of white canvas to better reflect the heat rays while the tent itself is of dark canvas, to subdue the light in the interior.

Through the kindness of the Surgeon-General, a tent made on the above plan was recently received at Washington Barracks for experimental purposes. For comparison it was pitched within a few feet of both the regulation hospital tent and the regulation conical wall tent of the latest model. A thermometer was suspended in the centre of each tent about four feet from the ground; and, for better comparison, one was also placed in the dense shade given by near-by foliage, while another was exposed in the open air to the direct rays of the sun. The several temperatures were taken hourly during the heated parts of the day and were noted as follows:



Front view of tent showing air space between roof and fly.



Lateral view of tent showing overhang of fly.



Lateral view of tent with fly thrown back, showing false ridge and ridge ventilation.

Date.	Hour.	In the Sun.	In the Shade	Improved Hosp. Tent.	Reg. Hosp. Tent.	New Model Conical Wall Tent.	Remarks.
Thursday, Sept. 7th.	1	87	79½	84	89	93½	Walls down
	2	94	80½	86	94½	100	“ “
	3	90	83	86	93	97	“ “
Friday, Sept. 8th.	11	95	84	89½	99	107	Walls down
	12	97	88	93	97½	106½	“ “
	1	103½	88½	90½	96	98	Walls rolled up. Thermometer 2 feet above level of wall
	2	104½	93	90	94	93½	
	3	93	88	89	92	91½	

These figures show a temperature in the improved hospital tent, walls down, never more than 5½ degrees higher than that in the densest shade available, and once only three degrees higher. As compared with the regulation hospital tent, with walls down, the temperature of the improved tent averaged (five readings made during two days) 87.5° for the latter and 94.5° for the former—an average difference of seven degrees. The improved tent was never less than 4½ degrees cooler, and twice was 8½ degrees cooler. On one subsequent occasion a difference of 10½ degrees was noted. As compared with the conical wall tent, the temperature ranged from 9½ to 18½ degrees lower in the improved tent. Such a divergence of temperature means, in the tropics, all the difference between comfort and distress for the well and such relief from great and depressing heat as would do much to bring about recovery in the sick. It was noted that the improved tent cooled down much more rapidly than did the old style tents. The latter absorbed and apparently imprisoned the solar heat, so that frequently the thermometer on the inside of the closed tent was considerably higher than the one outside exposed to the direct solar rays. Such an undesirable condition of affairs was never even approached in the improved tent.

While elevation of the tent walls, in the regulation tentage, considerably lowers the inside temperature, the ventilation of the improved tent is so complete that such action lowers the thermometer no more than two or three degrees at most; so that the sick can be kept in the subdued light and comparative quiet and seclusion of the closed tent without discomfort or depressing effects. With tent walls fully rolled up, the temperature of the improved tent ranges from three to six degrees lower than in the regulation tent—about the same difference existing between the former and the conical wall tent. With walls raised, the temperature of the improved tent is approximately the same as is found in the dense shade of a leafy tree.

The principles as outlined for the case of the hospital tent may also be applied to the officer's wall tent and would conduce much to the comfort of the inmates during warm weather. In order that the tent might be still available for use in cold weather within the United States, it is suggested that such tents might be provided with a separate ridge-cap of canvas, extending several inches below the lower border of the netting. Such a ridge-cap could be readily and securely fastened in place by means of grommets and eyelets, when required.

The conical wall or modified Sibley tent already possesses excellent ventilation through the opening at the apex. It lacks, however, a fly—and no tent should be issued for use in the tropics without such additional protection. Such a fly could be made in the form of a truncated cone, having a diameter at base and apex two feet greater than that of the tent, and could be supported from a large ring and the centre pole, the same as is the tent itself. The length should, of course, be a trifle greater than the canvas of the present tent, exclusive of its wall. The addition of such a fly entails but little extra expense and would require absolutely no changes in the tent as now supplied. The maintenance of comfort and hence efficiency of the command necessitates the issue of such additional protection.

The common wall tent is, on account of its size and lack of fly, totally unsuited for use in the tropics—and this fact cannot be too strongly impressed upon those in authority; who, lacking experience in its use under such conditions, still insist upon its employment. Troops who are to live under canvas in the low latitudes should only be quartered in the improved hospital tent or in the conical wall tent provided with a fly, as suggested above.

XXIX. THE INFLUENCE OF THE CLIMATE OF WHIPPLE BARRACKS, ARIZONA, UPON PULMONARY TUBERCULOSIS, AS SHOWN BY ARMY EXPERIENCE.

By ALEX, S. PORTER,

FIRST LIEUTENANT, AND ASSISTANT SURGEON, U. S. ARMY.

WHIPPLE BARRACKS, near Prescott, Arizona, is over 3500 feet in altitude; is situated upon a tableland, surrounded by mountain ranges covered with considerable growth; that is, for Arizona. There is more or less moisture in the air, the roots of the trees and overgrowth, holding the water from the heavy snows, and the summer rains; but this moisture is driven away by the prevalent high winds, especially during March, April and May. We have in our winter, from December to March, inclusive, about three or four snow storms, which are in reality blizzards, the temperature often falling ten degrees below zero; such storms lasting from twenty-four to forty-eight hours. After the snow has passed away, the weather is very fine for several weeks, when another storm comes. The variation of temperatures is very great. The nights are always very cold in comparison with the days. Through July and August we have the so-called "wet season," having daily rains, thunderstorms and electric storms; and if the season is a dry one, Autumn sets in about the 1st. of September. We have then the most beautiful and beneficent weather imaginable. I have seen none surpass it. From June to December, the invalids do remarkably well, and gain flesh rapidly. Occasionally, however, in September we have a continuance of the rainy season; the rains become cold and the dampness makes it disagreeable and unfit for the sick, particularly for consumptives. Arizona is not considered a summer climate for any disease, by the general public, and the phrase, "Arizona weather," seems to stand for one hot, dry, and sunshiny climate; but within its boundaries we have all the varieties of climate known; from that similar to the Adiron-

dacks, with its very cold, and dry, to that of Mid Georgia with its warmth, and pines; from the dry Montana summer to the beautiful heights in the Blue Ridges of Western North Carolina, with its cool and bracing atmosphere.

In Whipple Barracks we have an ideal climate for pulmonary tuberculosis in the Summer and Fall, from June to December. All the cases cared for at the Post Hospital did well during this period; at least, not one went backward, and one patient especially improved. This soldier came to Whipple in July. Regained his general health. Had an excellent appetite and enjoyed life. Nevertheless he still has the tubercle bacillus in his sputum. He went on furlough to Phoenix, in November, by our recommendation, and still continues to improve.

A second case, reported from Fort Niobrara, Nebraska, in March. He was not a patient to have been sent from home. He died in November. Three other patients held their own during this period. The summers are not too hot, and we have sunshine every day. The patients may be out of doors all the time. Our patients sleep in tents. The nights are cool, necessitating the use of blankets. We have an absence of the debilitating sweats of hot nights, which it is impossible to prevent in the lower parts of Arizona.

Whipple is a very injurious place for a consumptive in winter and early spring. The weather is simply treacherous. The commencement of the day may be bright and warm, and at any hour a change may take place; a great fall of temperature, and a blizzard coming upon us unawares. Such rapid changes render sensitive lungs, not to speak of tuberculous lungs, liable to one of the most dangerous of diseases, croupous pneumonia. The practicing physician knows the great danger of having an acute congestion located in the healthy (*lone*) lung of a tuberculous patient. One case, particularly, illustrates this at Whipple. Lieutenant B—— came to this place in April, 1897. Did very well during Summer and Fall. In December we had a very severe blizzard, and a fall of temperature to minus eight degrees. Then a few days of beautiful sunshine. The day before Christmas we had a sudden change, and Lieutenant B—— contracted a pneumonia in his healthy lung and was dead in less than twenty-four hours.

Another patient passed through the Winter fairly well. Had a limited consolidation in apex of left lung. In the early Spring he took cold and the tuberculous process extended a couple of inches further down in his lung; this cold was due to the high winds. Still another instance. This patient has passed five Winters in Whipple. Each winter he has had an exacerbation of the tuberculous process in his lungs. Each time his life was despaired of. He now weighs ninety pounds; he has not improved; but outwardly he does not seem to be any worse off than when he arrived here. The secret of his being able to live so long has been the great care he takes of himself, and the excellent nourishment he is able to provide. His age may be a factor, being over forty years, morbid processes and also inflammatory action being slower at this age.

One patient treated by us was J. G. ———, musician. Disease contracted at West Point, New York. Age, 26 years. Weight at entrance, 125 pounds; usual weight, 135 pounds. Came to Whipple in February, 1897. At first did very well. Had consolidation of apex of right lung. Condition became stationary. In the Summer he began the oxy-tuberculin of Hirschfelder of San Francisco. After the eleventh dose had an attack of acute articular rheumatism. Treatment stopped. After recovery, oxy-tuberculin started again. After a few doses he had a second attack of acute articular rheumatism which confined him to his bed for several weeks. While in bed he had a severe pulmonary hemorrhage. Lost about one-half a pint of blood. Was very much emaciated and run down. Found out that he was subject to rheumatism. He was given his discharge in December—total disability. He came to Phoenix on my recommendation. He is taking 15 c.c. of oxy-tuberculin daily. Has gained fifteen pounds and looks like a well man. Still he expectorates a tenacious muco-purulent sputum. Whipple is notorious for causing and continuing rheumatism.

Three other soldiers sent here, apparently for pulmonary tuberculosis. All have done well. Two of these have never been proven tuberculous, although repeated examinations have been made of their sputa also, there are no well marked physical signs. The third patient came from Jefferson Barracks, and

looks like a tuberculotic, but we have never been able to get enough sputum to examine. These cases go to make up false statistics.

There can be no hard and fast rules, and no exactly justifiable conclusions drawn concerning the benefit or injury of any climate. And from year to year we cannot be sure of a repetition of weather. However, we may come to one general conclusion, which is, that no great benefit has been shown, or demonstrated, in any season of the year in tuberculosis, particularly at Whipple Barracks; and that it is not a good place for such cases in Winter and Spring. And when they do receive benefit from a Summer sojourn, they should be ordered away to other more suitable climates as the Winter approaches, Phoenix and Tucson being very admirable places for such patients from December to July. A very grave mistake is made in sending to such resorts the class of patients we see daily walking the streets. They are too far gone for any permanent improvement. But I am sure that had these places been chosen when the same patients were first attacked, the percentage of cured and improved would even exceed the great mortality we now know.

Arizona has cured, and can cure, many tuberculous people, but they must be sent early in the disease; and each patient must search diligently for the most suitable portion of the Territory for his own individual case.

XXX. NOTES ON RECENT PROGRESS IN MILITARY SURGERY.¹

BY CAPTAIN JAMES E. PILCHER,

CARLISLE, PENNSYLVANIA,

ASSISTANT SURGEON IN THE UNITED STATES ARMY; RECENTLY
MAJOR AND BRIGADE SURGEON OF UNITED
STATES VOLUNTEERS.

AMBROISE PARÉ AND HIS TIMES.—It is a gratifying indication of the development of interest in the more literary phases of medicine that the present year sees the issue of a number of biographies of famous pioneers in medicine. The encouragement to progressive work to be derived from the perusal of the labors and successes of the leaders in the Healing Art of bygone days, has been honored too much in the breach in training the medical neophytes of the present day, and it is gratifying to learn that there is not hereafter to be any shortage in the source of information upon this important topic.

Mr. Stephen Paget's biography² of the Father of Modern Military Surgery is of particular interest to the members of the Association of Military Surgeons. So far as it was possible for such an office to be imagined in that day of surgical degradation, Ambroise Paré was Surgeon General of the French Army during the reigns of four successive kings of France,—Henry II, Francis II, Charles IX, and Henry III. Entering upon his life-work as an apprentice to a humble barber-surgeon, by the exercise of sublime patience, exact observation, and persistent study, he emerged from the realm of that mechanical trade and achieved recognition as the master of a great profession. In 1636, at the

¹ It was a part of Captain Pilcher's plan for the conduct of the office of Secretary and Editor in 1897-1898, to present to the Association a complete review of the literature of military surgery during the year, but the absorbing duties of the Spanish-American War, and the consequent complete breakdown in his health rendered impossible the accomplishment of this purpose. The accompanying remarks in connection with the subject form but a fragment and are only presented to satisfy promises made by him.

² Ambroise Paré and His Times, 1510-1590. By Stephen Paget. 8vo., pp. 309 New York: G. P. Putnam's Sons, 1897.

age of twenty-seven,—the average age, by the way, of our own medical officers upon their appointment,—he was commissioned as a military surgeon, an office which he adorned with ever increasing *eclat* during the succeeding third of a century.

While Paré was not, as has been stated by some writers, the discoverer of the ligature as a hemostatic, he was certainly the introducer of it as a common surgical appliance. Before his time, the cautery was the method of election in the treatment of hemorrhage, and the bonfire was an indispensable factor of every military surgeon's armamentarium. After him the ligature was the only agent in the checking of the bleeding, and the discussion of the treatment of bleeding involved not the question of ligature or no ligature, but merely the material, form and methods of application of the ligature.

Hardly a procedure in military or general surgery failed to receive the impress of his master hand. To repeat the methods which he created or improved would be merely to repeat the catalogue of the surgical manipulations known to the operators of the sixteenth century. *Facile princeps* as a surgeon, he was no less a statesman. The confidential adviser of kings, the trusted mentor of ministers, his was a unique position in the society of a period replete with strange and mysterious characters. No work could be more interesting and none more worthy the reading of the military surgeon than an account of his life and deeds, and we must acknowledge a special debt to Mr. Paget for affording this opportunity to the profession.

WOUNDS IN WAR.—In these days of rapid progress in all scientific pursuits, a book begins to be more or less obsolete the day it falls from the press. The present work¹ was in the writer's hands several months before the beginning of the Spanish-American War, and had the meeting of June, 1898, at which a review of it was proposed to be read, occurred at the expected time, a critical discussion of the work would have been timely and possibly would have conveyed some information to the reviewer's hearers. But now, when every progressive military surgeon has

¹ WOUNDS IN WAR. The Mechanism of their Production and their Treatment. By Surgeon-Colonel W. F. STEVENSON, (Army Medical Department), A. B., M. B., M. Ch., Dublin University; Professor of Military Surgery, Army Medical School, Netley. 8vo. pp. 419., London, Longmans, Green & Co., 1897.

read it, when it has been made a part of the official library of every regimental, field and general military hospital in the United States and its dependencies, reference to its merits and to its deficiencies would be futile indeed. Its fortunate issue just prior to the opening of hostilities with Spain, gave to the medical officers during that campaign and during the Philippine Insurrection, a guide of the highest authority. The numerous and prolonged tests to which it has thus been subjected, have shown it to be of high practical value.

APPENDIX.

The Association of Military Surgeons of the United States.

CONSTITUTION AND BY-LAWS.

REVISED SEPTEMBER 28, 1899.

PREAMBLE.

The Military Surgeons of the United States, in order to promote and improve the science of Military Surgery, have associated themselves together and adopted the following Constitution and By-Laws:

CONSTITUTION.

ARTICLE I.

Name.

The organization shall be known as "The Association of Military Surgeons of the United States."

ARTICLE II.

Members.

SECTION 1. There shall be Active, Associate, Honorary, Corresponding, and Life Members.

ACTIVE MEMBERS.

SEC. 2. Commissioned medical officers of the United States Army, of the Navy, of the Marine Hospital Service, and of the National Guard, or Volunteer Militia of the several States are eligible for active membership. Active members may retain their membership should they be honorably discharged from the service in which they were commissioned. Active members only shall be eligible for office or entitled to vote.

ASSOCIATE MEMBERS.

SEC. 3. Ex-Medical officers and other officers of the above-mentioned services, and ex-medical officers of the United States Volunteer Service are eligible for associate membership.

HONORARY MEMBERS.

SEC. 4. Persons who are not qualified for active membership, but who have achieved distinction in the military service, are eligible as honorary members.

CORRESPONDING MEMBERS.

SEC. 5. Military surgeons living outside of the United States, who are prominent in the literature of military medicine and hygiene, are eligible as corresponding members.

LIFE MEMBERS.

SEC. 6. On payment of the sum of Fifty Dollars any active member may become a life member and be exempt from further dues.

ARTICLE III.

Officers and Committees.

OFFICERS.

SEC. 1. The officers shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold their respective offices until their successors are elected and qualify.

COMMITTEES.

SEC. 2. There shall be the following Standing Committees: An Executive Committee, to consist of the officers and ex-presidents, and five (5) members. A Publication Committee, to consist of three (3) members, one of whom shall be the Secretary as *ex-officio* Chairman. A Literary Committee, to consist of seven (7) members, four (4) members from the National Guard, State Troops or Militia, and one (1) each from the Army, Navy and Marine Hospital Service. A Nominating Committee, based upon a representative or one vote for each State, Territory, the Army, the Navy and the Marine Hospital Service, and for every additional ten (10) members or major fraction thereof, an extra representative or vote; said vote or votes to be cast by a member or members, present from each State, Territory, the Army, the Navy and the Marine Hospital Service, to be designated by the members present from each State, Territory, the Army, the Navy and the Marine Hospital Service at the time of meeting.

ARTICLE IV.

Quorum.

Thirty-five (35) members shall constitute a quorum for the transaction of business, but a less number may adjourn.

ARTICLE V.

Amendments.

All amendments to this Constitution and By-Laws shall be proposed in writing at one annual meeting, and voted on at the next. A three-fourths vote of all the members present at the annual meeting shall be necessary for adoption.

BY-LAWS.

ARTICLE I.

Election to Membership.

SEC. 1. Election to active or associate membership shall be by the Executive Committee, to whom the Secretary shall refer all applications, together with such credentials as may be presented.

SEC. 2. Election to honorary or corresponding membership shall be by a two-thirds vote of the Association, after the unanimous recommendation of the Executive Committee.

ARTICLE II.

Loss of Membership.

Any member who may be dismissed from the service for conduct unbecoming an officer and a gentleman, shall be expelled and debarred from any further rights or privileges when proper proof shall have been furnished the Secretary.

ARTICLE III.

Meetings.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting, the President, Vice-Presidents, Secretary and Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

Dues.

The dues to be paid by active and associate members shall be five dollars (\$5.00), due at the time of election; thereafter on January 1 of each year, in advance. Delinquents in the payment of dues will not be entitled to the Proceedings or other publications of the Association.

Delinquency for two years shall terminate membership, after due notice by the Treasurer.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

Duties of Officers.

THE PRESIDENT.

SEC. 1. The President shall preside at all meetings, appoint all committees, unless otherwise provided for, approve all proper bills, and perform such other duties as are usually incumbent upon such an officer.

THE VICE-PRESIDENTS.

SEC. 2. The Vice-Presidents, in order of seniority, shall perform the duties of President in the absence or inability of that officer.

THE SECRETARY.

SEC. 3. The Secretary shall keep the records and archives, issue certificates of membership to honorary and corresponding members on election, to active and associate members when notified by the Treasurer that the proper dues have been paid.

He shall present to the Publication Committee a synopsis of the proceedings, and such papers as the authors desire to have published by the Association. He shall receive all applications for membership and refer the same to the Executive Committee. He shall notify the Treasurer of the election of active and associate members, and shall prepare an annual report. At each annual meeting he shall appoint an Assistant Secretary.

THE TREASURER.

SEC. 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved. He shall have charge of all publications, and distribute the same to those who are entitled to them. He shall notify the Secretary when new active and associate members have paid and are entitled to certificates of membership.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties; the Association to bear the cost of this insurance.

ARTICLE VI.

Duties of Committees.

THE EXECUTIVE COMMITTEE.

SEC. 1. The Executive Committee shall perform the duties prescribed by the Constitution and By-Laws, and such other administra-

tive or executive duties as may be referred to it, and for which provision has not otherwise been made. The President shall be *ex officio* chairman.

THE PUBLICATION COMMITTEE.

SEC. 2. The Publication Committee shall determine what portions of the proceedings are of sufficient general interest to be printed.

It shall also decide on the advisability of publishing the various papers presented at the annual meeting, and shall prepare for publication, contract for printing and see through the press all such papers in a volume of Annual Transactions; but all contracts for printing must first have the approval of the President and Treasurer.

THE LITERARY COMMITTEE.

SEC. 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

THE NOMINATING COMMITTEE.

SEC. 4. The Nominating Committee shall, at the annual meeting, present a list of candidates for the various offices for the ensuing year.

The vote, or votes, of the Nominating Committee shall be cast by a member, or members, who shall be designated by the members present, from each State or Territory, the Army, the Navy and the Marine Hospital Service.

OFFICERS OF THE ASSOCIATION FROM ITS ORGANIZATION.

1891.

FIRST MEETING HELD AT LELAND HOTEL, CHICAGO, ILL., SEPT. 17 AND 18,
1891. BRIG. GEN. NICHOLAS SENN, SURGEON GENERAL OF
WISCONSIN, PRESIDING.

1891-1892.

SECOND MEETING HELD AT MEMORIAL HALL, ST. LOUIS, MO.,
APRIL 19, 20 AND 21, 1892.

President—Nicholas Senn, Brig. Gen. and Surg. Gen., Wis.
First Vice-President—Nelson H. Henry, Maj. and Surg. N. G. S. N. Y.
Second Vice-President—E. Chancellor, Lt. Col., Med. Dir., N. G., Mo.
Secretary—F. L. Matthews, Col. and Surg. Gen., N. G., Ill.
Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.
Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.
Chairman Com. of Arrangements for 1892—E. Chancellor, Lt. Col. and
Med. Dir., N. G., Mo.

1892-1893.

THIRD MEETING HELD AT RUSH MEDICAL COLLEGE AND THE U. S. GOV-
ERNMENT BUILDING, WORLD'S FAIR, CHICAGO, ILL.,
AUG. 8, 9 AND 10, 1893.

President—Nicholas Senn, Col. and Surg. Gen., N. G., Ill.
Honorary President—C. R. Greenleaf, Lt. Col. and Dep. Surg. Gen.,
U. S. A.
First Vice-President—Nelson H. Henry, Maj. and Surg., N. G. S. N. Y.
Second Vice-President—C. M. Woodward, Lt. Col. and Surg. Gen., Mich.
Secretary—E. Chancellor, Lt. Col. and Med. Dir., N. G., Mo.
Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.
Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.
Chairman Com. of Arrangements for 1893—Charles Adams, Maj. and Surg.,
N. G., Ill.

1893-1894.

FOURTH MEETING HELD AT THE NATIONAL THEATRE AND THE NATIONAL MUSEUM, WASHINGTON, D. C., MAY 1, 2 AND 3, 1894.

President—Nicholas Senn, Col. and Surg. Gen., N. G., Ill.

First Vice-President—B. J. D. Irwin, Col. and Asst. Surg. Gen., U. S. A.

Second Vice-President—Louis W. Read, Col. and Surg. Gen., N. G., Pa.

Secretary—E. Chancellor, Lt. Col. and Med. Dir., N. G., Mo.

Assistant Secretary—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.

Treasurer—Lawrence C. Carr, Maj. and Surg., Ohio N. G.

Chairman Com. of Arrangements for 1894—George Henderson, Maj. and Surg. Gen., D. C.

1894-1895.

FIFTH MEETING HELD AT THE STAR THEATRE AND ALUMNI HALL,
UNIVERSITY OF BUFFALO, BUFFALO, N. Y.,
MAY 21, 22 AND 23, 1895.

President—George M. Sternberg, Brig. Gen. and Surg. Gen., U. S. A.

First Vice-President—Louis W. Read, Col. and Surg. Gen., N. G., Pa.

Second Vice-President—Albert L. Gihon, (Commodore,) Med. Dir., U. S. N.

Secretary—E. Chancellor, Lt. Col. and Med. Dir., N. G., Mo.

Assistant Secretary—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.

Treasurer—Lawrence C. Carr, Maj. and Surg., Ohio N. G.

Chairman Com. of Arrangements for 1895—Albert H. Briggs, Maj. and Surg., N. G. S. N. Y.

1895-1896.

SIXTH MEETING HELD AT THE BROAD STREET THEATRE, HOTEL WALTON,
UNIVERSITY OF PENNSYLVANIA, AND UNION LEAGUE CLUB,
PHILADELPHIA, PA., MAY 12, 13 AND 14, 1896.

President—Louis W. Read, Col. and Surg. Gen., N. G., Pa.

First Vice-President—Albert L. Gihon, Med. Dir., (Commodore) (Ret.), U. S. N.

Second Vice-President—Charles H. Alden, Asst. Surg. Gen., U. S. A.

Secretary—E. Chancellor, Lt. Col. and Med. Dir., N. G., Mo.

Treasurer—Lawrence C. Carr, Maj. and Surg., Ohio N. G.

Editor—Philip F. Harvey, Maj. and Surg., U. S. A.

Chairman Com. of Arrangements for 1896—J. Wilks O'Neill, Maj. and Surg., N. G., Pa.

1896-1897.

SEVENTH MEETING HELD AT THE HIGH STREET THEATRE, THE OHIO
SENATE CHAMBER, STARLING MEDICAL COLLEGE AND
COLUMBUS BARRACKS, COLUMBUS, OHIO,
MAY 25, 26 AND 27, 1897.

President—Albert L. Gihon, Med. Dir. (Commodore) (Ret.), U. S. N.

First Vice-President—Edward J. Forster, Brig. Gen. and Surg. Gen.,
(Deceased), Mass. V. M.

Second Vice-President—John Van R. Hoff, Maj. and Surg., U. S. A.

Secretary—Herman Burgin, Maj. and Surg., N. G., Pa.

Assistant Secretary—James E. Pilcher, Capt. and Asst. Surg., U. S. A.

Treasurer—James J. Erwin, Capt. and Asst. Surg., Ohio N. G.

Editor—Charles C. Foster, Maj. and Surg., Mass. V. M.

Chairman Com. of Arrangements for 1897—Henry M. W. Moore, Maj. and
Surg., Ohio N. G.

1897-1899.

EIGHTH MEETING HELD AT CONVENTION HALL AND COMMERCIAL CLUB,
CHAMBER OF COMMERCE BUILDING, KANSAS CITY,
MO., SEPT. 27, 28 AND 29, 1899.

President—Jefferson D. Griffith, Lt.-Col. and Med. Dir., N. G. Mo.

First Vice-President—John Van Rensselaer Hoff, Maj. and Surg., U. S. A.

Second Vice-President—John C. Wise, Med. Insp. (Comdr.), U. S. N.

Secretary and Editor—James E. Pilcher, Capt. and Asst. Surg., U. S. A.

Treasurer—James J. Erwin, Capt. and Asst. Surg., O. N. G.

Assistant Secretary—W. A. Westervelt, Capt. and Asst. Surg., O. N. G.

Chairman Com. of Arrangements for 1899—Blencowe E. Fryer, Lt.-Col.
and Dep. Surg. Gen. (Ret.), U. S. A.

Register of Members.

REVISED TO APRIL 15, 1900.

NOTE.—The figures preceding each name in the Register of Members, indicate the year of election to membership.

The designations after the name, indicate (first) the grade of Military and Naval precedence, (second) the Corps Title, and (third) the service, State or National, in which commissioned. In the case of Naval Officers the grades are in brackets, indicating what is termed their "relative rank"; they are addressed officially by their corps titles, but in social intercourse it is customary in the Navy to address them simply as "Doctor." The following table exhibits the correspondence of grades and titles in the Army and Navy :

ARMY		NAVY	
GRADES	TITLES	GRADES	TITLES
Brig. General.	Surg.-General.	Commodore.	Surg.-General. Med. Dir. (ret'd.)
Colonel.	Asst. Surg.-General.	Captain.	Med. Director.
Lt.-Colonel.	Dep. Surg.-General.	Commander.	Med. Inspector.
Major.	Surgeon.	Lt.-Commander.	Surgeon.
Captain.	Asst. Surg. (after passing.)	Lieutenant.	Surgeon.
1st Lieut.	Asst. Surgeon.	Lt. j(unior)g(rade.)	Pd. Asst. Surg.
		Ensign.	Asst. Surgeon.

In addressing communications to military officers both the grade and title are used , in addressing naval officers, the latter only is employed, e. g.:

Major A *** B *** C ***,

Surgeon, U. S. Army,

Fort D *** , Ariz.

Surgeon F *** G *** H *** , U. S. N.;

U. S. S. I ***,

Naples, Italy.

LIFE MEMBERS.

ELECTED.

- | | |
|--|--|
| 1892 Adams, Charles,
<i>Secretary, 1899-00.</i> | Lt.-Col. and Asst. Surg.-Gen., I. N. G.,
Central Music Hall, Chicago, Ill. |
| 1891 Alden, Charles Henry,
<i>President, 1899-00.</i>
<i>Second VICE-Pres., 1895-96.</i> | Col. and Asst. Surg.-Gen., U. S. A.,
War Dept., Washington, D. C. |
| 1891 Chancellor, Eustathius,
<i>Secretary, 1892-96.</i>
<i>Second VICE-Pres., 1891-92</i> | Lt.-Col. and Med. Dir., N. G., Mo.,
Oriol Bldg., Sixth and Locust Sts.,
St. Louis, Mo. |
| 1894 Pilcher, James E.,
<i>Secretary and Editor, 1897-98.</i>
<i>Asst. Secretary, 1896-97.</i> | Capt. and Asst. Surg., U. S. A.,
Carlisle, Pa. |
| 1891 Senn, Nicholas,
<i>President, 1891-94.</i> | Col. and Surg.-Gen., I. N. G.,
532 Dearborn Ave., Chicago, Ill. |
| 1899 Wesley, Allen A., | Capt. and Asst. Surg., I. N. G.,
3102 State St., Chicago, Ill. |

ACTIVE MEMBERS.

ELECTED.

- 1894 Abbe, Edward Harper, Lt. (j. g.) and Asst. Surg., N. B., M. V. M.,
405 County St., New Bedford, Mass.
- 1895 Adair, George William, Maj. and Surg., U. S. A.,
Fort Sheridan, Ill.
- 1891 Adams, Charles Francis, Capt. and Asst. Surg., N. G., N. J.,
229 Union St., Hackensack, N. J.
- 1898 Allen, Arthur West, Maj. and Surg., N. G., Minn.,
Austin, Minn.
- 1895 Allen, Gardner Weld, Lt. Cmdr. and Surg., 1st N. B., M. V. M.,
417 Boylston St., Boston, Mass.
- 1891 Almy, Leonard Ballou, Lt. Col. and Med. Dir. (Ret.), N. G.,
Conn.,
173 Washington St., Norwich, Conn.
- 1895 Altree, George Herbert, Actg. Asst. Surg., U. S. M. H. S.,
Port Tampa, Florida.
- 1899 Ames, Azel, Maj. and Brig. Surg., U. S. V.,
Wakefield, Mass.
- 1894 Ames, Howard Emerson, Surg. (Lt.), U. S. N.,
Newport News, Va.
- 1894 Anderson, Frank, Surg. (Lt.), U. S. N.,
Naval Hospital, Yokohama, Japan.
- 1900 Angney, Wm. Muir, 1st Lt. and Asst. Surg., N. G., Pa.,
423 S. 15th St., Philadelphia, Pa.
- 1893 Anthony, Frank, Maj. and Surg., I. N. G.,
1st Ave., Sterling, Ill.
- 1893 Appel, Daniel Mitchell, Maj. and Surg., U. S. A.,
Fort Bayard, N. M.
- 1896 Archibald, O. Wellington, Col. and Surg. Gen., N. D., N. G.,
Jamestown, N. D.
- 1898 Armstrong, Francis Caldo, Maj. and Surg., N. G., Kan.,
El Dorado, Kan.
- 1895 Arnold, Herbert A., 1st Lt. and Asst. Surg., N. G., Pa.,
Treasurer, 1899-00. Ardmore, Pa.
- 1896 Arnold, Will Ford, P. A. Surg. (Lt. j. g.), U. S. N.,
Navy Yard, Pensacola, Fla.
- 1898 Artaud, Frank Edward, Maj. and Surg., La. V. I.,
New Iberia, La.
- 1895 Ashenfelter, William J., Maj. and Surg., N. G., Pa.,
Pottstown, Pa.
- 1897 Ashley, Maurice C., 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Middletown, N. Y.
- 1897 Ashmun, George C., Maj. and Surg., O. N. G.,
94 Republic St., Cleveland, O.
- 1897 Austin, Charles S., Maj. and Surg., N. G., Mo.,
Carrollton, Mo.
- 1894 Bache, Dallas, Col. and Asst. Surg. Gen., U. S. A.,
Surg. Gen'l's Office, Washington, D. C.
- 1895 Baker, John Walter, Surg. (Lt.), U. S. N. (Ret.),
Aurora, Ind.
- 1892 Baker, Washington Hopkins, Maj. and Surg. (Ret.), N. G., Pa.,
1610 Sumner St., Philadelphia, Pa.
- 1894 Balch, Lewis, Maj. and Surg., N. G. S. N. Y.,
14 Washington Ave., Albany, N. Y.

ELECTED.

- 1896 Banister, John Monro, Maj. and Surg., U. S. A.,
West Point, N. Y.
- 1895 Barber, George Holcomb, P. A. Surg. (Lt. j. g.), U. S. N.,
U. S. Naval Academy, Annapolis, Md.
- 1892 Barker, Christopher F., Maj. and Surg., R. I. M.,
32 Bull St., Newport, R. I.
- 1892 Barnes, Algernon S., Brig. Gen. and Surg. Gen. (Ret.), N. G.,
Mo.,
3434 Maple Ave., St. Louis, Mo.
- 1898 Barney, Reuben, Jr., Capt. and Asst. Surg., N. G., Mo.,
Chillicothe, Mo.
- 1897 Barry, William Francis, 1st Lt. and Asst. Surg., R. I. M.,
Woonsocket, R. I.
- 1899 Barstow, James Mason, Lt. Col. and Dep. Surg. Gen., N. G., Ia.,
Council Bluffs, Ia.
- 1894 Battle, Samuel Westray, Maj. and Asst. Surg. Gen., N. C.,
P. A. Surg. (Lt. j. g.), U. S. N. (Ret.),
Asheville, N. C.
- 1896 Bauer, Louis Demme, 1st Lt. and Asst. Surg., N. G., Pa.,
715 N. 5th St., Philadelphia, Pa.
- 1894 Bayles, George, Ex-Maj. and Surg., N. Y. Vol. Heavy
Artillery,
408 Main St., Orange, N. J.
- 1896 Belcher, William Nathan, Capt. and Asst. Surg., N. G. S. N. Y.,
25 Portland Ave., Brooklyn, N. Y.
- 1895 Bell, Robert Eddy, 2d Lt. Ambulance Corps, M. V. M.,
Lowell, Mass.
- 1893 Benedict, John Mitchell, Ex-Maj. and Surg., N. G., Conn.,
81 N. Main St., Waterbury, Conn.
- 1898 Benton, Frederick Leslie, Asst. Surg., U. S. N.,
Care Navy Dept., Washington, D. C.
- 1891 Bergen, Andrew C., Lt. Col. and Surg., N. G., Ia.,
400 4th St., Sioux City, Ia.
- 1893 Bertollette, Daniel Nicholas, Surg. (Lt.), U. S. N.,
Navy Yard, Washington, D. C.
- 1895 Beyer, Henry Gustav, Ph. D., Surg. (Lt.), U. S. N.,
Navy Yard, Boston, Mass.
- 1895 Birmingham, Henry P., Maj. and Surg., U. S. A.,
Manila, P. I.
- 1894 Blackwood, Norman Jerome, P. A. Surg. (Lt. j. g.), U. S. N.,
Naval Hospital, Philadelphia, Pa.
- 1900 Blademan, Robert Sylvester, P. A. Surg. (Lt. j. g.), U. S. N.,
U. S. Naval Hospital, Newport, R. I.
- 1895 Blood, Robert Allen, Brig. Gen. and Surg. Gen., M. V. M.,
39 High St., Charlestown, Mass.
- 1897 Blubaugh, Charles B., Lt. Col. and Med. Dir., W. Va. N. G.,
1010 Murdoch Ave., Parkersburg,
W. Va.
1895. Boeckmann, Eduard, Lt. Col. and Asst. Surg. Gen., N. G.,
Minn. (Ret.),
Lowry Arcade, St. Paul, Minn.
- 1895 Borden, William Cline, Capt. and Asst. Surg., U. S. A.,
Washington Barracks, D. C.
- 1895 Bowen, George Austin, Ex-Brig. Gen. and Surg. Gen., N. G.,
Conn.,
Woodstock, Conn.

ELECTED.

- 1895 Boyd, Robert, Asst. Surg., U. S. N.,
U. S. Naval Hospital, Philadelphia,
Pa.
- 1894 Boyd, John C., Med. Insp. (Com'd'r), U. S. N.,
Bur. Med. and Surg., Navy Dept.,
Washington, D. C.
- 1891 Bradbury, Bial Francisco, Maj. and Surg., Me. V. M.,
Norway, Me.
- 1896 Bradley, Alfred E., Capt. and Asst. Surg., U. S. A.,
St. Paul, Minn.
- 1895 Bradley, George Perley, Med. Insp. (Com'd'r), U. S. N.,
Naval Hosp., Mare Island, Cal.
- 1891 Brannen, Dennis J., Capt. and Asst. Surg., N. G., Ariz.,
Flagstaff, Ariz.
- 1892 Briggs, Albert Henry, Maj. and Surg., N. G. S. N. Y.,
267 Hudson St., Buffalo, N. Y.
- 1898 Brodrick, Richard Godfrey, P. A. Surg., U. S. N.,
1037 5th Ave., New York, N. Y.
- 1897 Brooke, John, Maj. and Surg. (Ret.), U. S. A.,
Radnor, Pa.
- 1894 Brown, Orland J., Maj. and Surg., M. V. M.,
North Adams, Mass.
- 1900 Brownell, Carl DeWolf, P. A. Surg., U. S. N.,
Bristol, R. I.
- 1895 Brubaker, John L., 1st Lt. and Asst. Surg., N. G., Pa.,
1224 4th Ave., Altoona, Pa.
- 1898 Bruce, Charles E., Maj. and Surg. (Ret.), N. G. S. N. Y.,
176th St. and Amsterdam Ave.,
New York, N. Y.
- 1898 Brugman, Albert Ferdinand, 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Hotel Endicott, New York, N. Y.
- 1895 Brush, Edmund Cone, Brig. Gen. and Surg. Gen., O. N. G.,
Zanesville, O.
- 1891 Bryant, Joseph Decatur, Brig. Gen. and Surg. Gen. (Ret.), N. G.
S. N. Y.,
54 W. 36th St., New York, N. Y.
- 1893 Budlong, John Clark, Brig. Gen. and Surg. Gen. (Ret.), R.
I. M.,
604 Westminster St., Providence, R. I.
- 1895 Bunts, Frank Emory, Capt. and Asst. Surg., O. N. G.,
275 Prospect St., Cleveland, O.
- 1896 Burgin, Henry, Maj. and Surg., N. G., Pa.,
Germantown, Pa.
- 1897 Burns, Robert, Maj. and Surg., N. G., N. H.,
Plymouth, N. H.
- 1891 Byers, Frederick W., Brig. Gen. and Surg. Gen., Wis.,
Monroe, Wis.
- 1895 Byrne, Charles C., Col. and Asst. Surg. Gen., U. S. A.,
Governor's Island, New York, N. Y.
- 1899 Calef, J. Francis, Brig. Gen. and Surg. Gen., N. G., Conn.,
Middletown, Conn.
- 1897 Campbell, William Francis, 1st Lt. and Asst. Surg., N. G. S. N. Y.,
127 Lafayette Ave., Brooklyn, N. Y.
- 1895 Campbell, William Robertson, 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Niagara Falls, N. Y.
- 1897 Carpenter, Dudley Newcomb, Asst. Surg. (Lt. j. g.), U. S. N.,
Navy Yard, Boston, Mass.

ELECTED.

- 1899 Carr, E. Arthur, Maj. and Surg., N. G., Neb.,
1205 O St., Lincoln, Neb.
- 1893 Carr, George Wheaton, Lt. Col. and Med. Dir. (Ret.), R. I. M.,
27 Waterman St., Providence, R. I.
- 1894 Carrington, Charles Venable, Capt. and Asst. Surg., Va. Vols.,
932 Park Ave., Richmond, Va.
- 1897 Carter, Edward Champe, Maj. and Surg., U. S. A.,
1814 G St., Washington, D. C.
- 1893 Cassidy, Patrick, Ex-Brig. Gen. and Surg. Gen., N. G.,
Conn.,
Norwich, Conn.
- 1896 Castle, Charles Henry, Capt. and Asst. Surg., O. N. G.,
215 W. 9th St., Cincinnati, O.
- 1895 Cawley, Morris Franklin, 1st Lt. and Asst. Surg., N. G., Pa.,
31 N. 9th St., Allentown, Pa.
- 1891 Chandler, Ralph, Capt. and Asst. Surg., N. G., Wis.,
Cor. Sec., 1891-93. 13 Grand Ave., Milwaukee, Wis.
- 1892 Clark, Thomas Chalmers, Maj. and Surg., N. G., Minn.,
Stillwater, Minn.
- 1897 Clarke, Joseph Taylor, Capt. and Asst. Surg., U. S. A.,
Care War Dept., Washington, D. C.
- 1898 Cogswell, William, Maj. and Surg., M. V. M.,
241 Boylston St., Boston, Mass.
- 1900 Colby, Charles DeWitt, Capt. and Asst. Surg., N. G., Mich.,
Albion, Mich.
- 1893 Cole, Charles M., 1st Lt. and Asst. Surg., R. I. M.,
250 Broadway, Newport, R. I.
- 1895 Cook, Charles P., Col. and Asst. Surg. Gen., N. G. S.
N. Y.,
243 Warren St., Hudson, N. Y.
- 1896 Cook, Frank Clarendon, P. A. Surg. (Lt. j. g.), U. S. N.,
U. S. S. "Wilmington," Care Navy
Dept., Washington, D. C.
- 1893 Cook, George, Brig. Gen. and Surg. Gen. (Ret.), N.
G., N. H.,
16 Center St., Concord, N. H.
- 1899 Coon, George M., Lt. and Asst. Surg., N. G., Minn.,
110 Lowry Arcade, St. Paul, Minn.
- 1894 Corwin, Richard Warren, Col. and Asst. Surg. Gen., N. G., Colo.,
Pueblo, Colo.
- 1895 Cowell, George B., 1st Lt. and Asst. Surg., N. G., Conn.,
120 E. Washington Ave., Bridgeport,
Conn.
- 1895 Crandall, Rand Percy, P. A. Surg. (Lt. j. g.), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1894 Crispel, Charles Winegar, 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Rondout, N. Y.
- 1897 Crooker, George Hazard, Ex-Capt. and Asst. Surg., R. I. M.,
159½ Benefit St., Providence, R. I.
- 1893 Cullen, Gilbert Isham, Capt. and Asst. Surg., O. N. G.,
714 W. 6th St., Cincinnati, O.
- 1894 Currier, Edward Hervey, Lt. Col and Med. Dir., N. G., N. H.,
782 Elm St., Manchester, N. H.
- 1898 Czibulka, Alfons Clemens, 1st Lt. and Asst. Surg., I. N. G.,
Warren, Ill.
- 1898 Daly, William H., Maj. and Chief Surg., U. S. V.,
516 Market St., Pittsburgh, Pa.

ELECTED.

1895	Dawson, Lewis Reeves,	Lt. Col. and Brig. Surg., N. G., Wash., Seattle, Washington.
1895	Day, Frank Leslie,	Maj. and Surg., R. I. M., 240 Benefit St., Providence, R. I.
1894	Dearing, Howard Sumner,	1st Lt. and Asst. Surg., M. V. M., 607 Tremont St., Boston, Mass.
1898	de Forest, Henry Pelouze,	Capt. and Asst. Surg., N. G. S. N. Y., 369 Hancock St., Brooklyn, N. Y.
1891	de Niedman, Wladimir Feodor,	Maj. and Surg., N. G., Kan., Lachta Place, Pittsburg, Kan.
1895	Derr, Ezra Z.,	Surg. (Lt.), U. S. N., Portsmouth, N. H.,
1894	Devine, William H.,	Lt. Col. and Med Dir., M. V. M., 595 Broadway, So. Boston, Mass.
1897	Dickerson, John Henry,	Capt. and Asst. Surg., O. N. G., 225 N. Champion Ave., Columbus, O.
1897	Dickson, Samuel Henry,	Surg. (Lt.), U. S. N., Care Navy Dept., Washington, D. C.
1899	Dillenbeck, F. E.,	Capt. and Asst. Surg., N. G., Kan., El Dorado, Kan.
1895	Dixon, Charles Henry,	Maj. and Surg., N. G. Mo., 3345 Morgan St., St. Louis, Mo.
1898	Dougherty, Arthur C.,	2d Lt. and Asst. Surg., N. G., N. J., 153 Washington St., Newark, N. J.
1896	Dunn, J. P.,	Maj. and Surg., N. G., Cal., 536 24th St., Oakland, Cal.
1895	Dunn, Lewis D.,	Asst. Surg. (Lt. j. g.), Ill. N. R., 428 19th St., Moline, Ill.
1893	Dutton, Charles Elvan,	1st Lt. and Asst. Surg., N. G., Minn., 602 Nicollet Ave., Minneapolis, Minn.
1893	Eagleson, James Beaty,	Col. and Surg. Gen., N. G., Wash., 512 Burke Bldg., Seattle, Wash.
1894	Edie, Guy L.,	Capt. and Asst. Surg., U. S. A., Care War Dept., Washington, D. C.
1891	Edwards, John B.,	Brig. Gen. and Surg. Gen., N. G., Wis., Mauston, Wis.
1891	Egle, William Henry,	Maj. and Surg., N. G., Pa., State Library, Harrisburg, Pa.
1895	Emmerling, Karl A.,	1st Lt. and Asst. Surg., N. G., Pa., Pittsburgh, Pa.
1895	Erwin, James J., <i>Treasurer, 1896-98.</i>	Capt. and Asst. Surg., O. N. G., 1617 Cedar Ave., Cleveland, O.
1891	Evans, Theodore W.,	Maj. and Surg., N. G., Wis., 3 Pinckney St., Madison, Wis.
1897	Fales, Warren Dexter,	Lt. and Asst. Surg., Cmdg. Amb. Corps, N. G., D. C., 915 L St., N. W., Washington, D. C.
1898	Farenholt, Ammen,	P. A. Surg. (Lt. j. g.), U. S. N., Care Surg. Gen., U. S. N., Washington, D. C.
1896	Farrell, P. J. H.,	Capt. and Asst. Surg., N. G., Cal., 235 Post St., San Francisco, Cal.
1891	Festorazzi, Angelo,	Ex-1st Lt. and Asst. Surg., S. T., Ala., 153 Government St., Mobile, Ala.
1897	Fish, Earl Hamilton,	1st Lt. and Asst. Surg., N. G., Colo., 2535 Champa St., Denver, Colo.

ELECTED.

- 1892 Fitz Gerald, Reynaldo Juan, Lt. Col. and Med. Dir., N. G., Minn.,
128 5th St., So. Minneapolis, Minn.
- 1896 Fitzpatrick, Charles, Jr., 1st Lt. and Asst. Surg., N. G., Pa.,
2223 Jefferson St., Philadelphia, Pa.
- 1897 Flagg, Charles Edward Belin, Capt. and Asst. Surg., U. S. A.,
Care Surg. Gen., Washington, D. C.
- 1893 Forwood, William Henry, Col. and Asst. Surg. Gen., U. S. A.,
San Francisco, Cal.
- 1894 Foster, Charles Chauncey, Maj. and Surg., M. V. M.,
Editor, 1896-97. 8 Elmwood Ave., Cambridge, Mass.
- 1892 Foster, Romulus Adams, 1st Lt. and Asst. Surg., N. G., D. C.,
2029 Q St., N. W., Washington, D. C.
- 1893 Fowler, George Ryerson, Maj. and Surg., N. G. S. N. Y.,
301 De Kalb Ave., Brooklyn, N. Y.
- 1896 Frazier, Charles Harrison, 1st Lt. and Asst. Surg., N. G., Pa.,
133 So. 18th St., Philadelphia, Pa.
- 1893 French, Charles Henry, Lt. Col. and Med. Dir., R. I. M.,
109 Broadway, Pawtucket, R. I.
- 1897 Frick, Euclid Bernardo, Capt. and Asst. Surg., U. S. A.,
Fort Wadsworth, N. Y.
- 1894 Fritts, Crawford E., 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Hudson, N. Y.
- 1897 Fryer, Blencowe E., Lt. Col. and Den. Surg. Gen. (Ret.), U. S. A.,
520 E. 9th St., Kansas City, Mo.
- 1891 Fuller, Charles Gordon, Maj. and Surg., I. N. G.,
Central Music Hall, Chicago, Ill.
- 1894 Fulton, John F., Brig. Gen. and Surg. Gen., N. G., Minn.,
St. Paul, Minn.
- 1894 Fulton, William C., Maj. and Surg., N. G., Pa.,
433 Wyoming Ave., Scranton, Pa.
- 1895 Gandy, Charles Moore, Capt. and Asst. Surg., U. S. A.,
Ft. Slocum, New York.
- 1894 Gardner, Edwin Fisher, Maj. and Surg., U. S. A.,
Fort Grant, Ariz.
- 1895 Gates, Manley Fitch, P. A. Surg. (Lt. j. g.), U. S. N.,
Naval Hospital, Norfolk, Va.
- 1893 Gauntt, Franklin, Lt. Col. and Surg., N. G., N. J.,
Burlington, N. J.
- 1897 Gibson, Robert Jackson, Maj. and Surg., U. S. A.,
San Francisco, Cal.
- 1892 Gihon, Albert Leary, Med. Dir. (Commodore), (Ret.), U. S. N.,
Reform Club, New York, N. Y.
- President, 1896-97.*
First Vice-Pres., 1895-96.
Second Vice-Pres., 1894-95.
- 1898 Gilham, Cuthbert, Maj. and Surg., N. G., W. Va.,
Ansted, W. Va.
- 1893 Girard, Alfred C., Maj. and Surg., U. S. A.,
San Francisco, Cal.
- 1894 Glennan, James D., Capt. and Asst. Surg., U. S. A.,
Care Surg. Gen., Washington, D. C.
- 1896 Glover, Lawrence Litchfield, Ens. and Asst. Surg., N. R., N. J.,
Haddonfield, N. J.
- 1892 Godfrey, Charles Cartlidge, Ex-Maj. and Surg., N. G., Conn.,
242 State St., Bridgeport, Conn.
- 1892 Godfrey, E. L. B., Col. and Asst. Surg. Gen., N. G., N. J.,
400 Linden St., Camden, N. J.

ELECTED.

1894	Godfrey, Guy Charles Moore.	Capt. and Asst. Surg., U. S. A., Pinar del Rio, Cuba.
1891	Goode, Rhett,	Capt. and Asst. Surg., S. T., Ala. Mobile, Ala.
1899	Goodrich, Asa F.,	Lt. and Asst. Surg., N. G., Minn., Germania Bldg., St. Paul, Minn.
1897	Gotwald, David King,	Capt. and Asst. Surg., O. N. G., Springfield, O.
1891	Grannis, Edward H.,	Maj. and Surg., N. G., Wis., Menominee, Wis.
1894	Grant, Thomas Page,	Capt. and Asst. Surg. (Ret.), K. S. G., 815 3d Ave., Louisville, Ky.
1899	Grant, William West,	Col. and Surg. Gen., N. G., Colo., Denver, Colo.
1894	Green, Charles Montraville,	Maj. and Surg., M. V. M., 78 Marlborough St., Boston, Mass.
1896	Greene, Francis V.,	P. A. Surg. (Lt.), (Ret.), U. S. N., 33 S. 19th St., Philadelphia, Pa.
1891	Greenleaf, Charles R., <i>Honorary Pres., 1892-93.</i>	Col. and Asst. Surg. Gen., U. S. A., Manila, P. I.
1891	Griffith, Jefferson D., <i>President, 1897-99</i>	Lt. Col. and Med. Dir., N. G., Mo., 9th and Grand Ave., Kansas City, Mo.
1898	Grunwell, Alfred Gilbert,	Asst. Surg., U. S. N., Care Navy Dept., Washington, D. C.
1897	Guerin, Lovett T.,	Maj. and Surg., O. N. G., 578 N. High St., Columbus, O.
1897	Gunsaulus, Fred,	Capt. and Asst. Surg., O. N. G., 29 W. Long St., Columbus, O.
1897	Guest, Middleton Semmes,	P. A. Surg. (Lt. j. g.), U. S. N., Naval Hospital, Philadelphia, Pa.
1896	Guthrie, Joseph Alfred,	P. A. Surg. (Lt. j. g.), U. S. N., Navy Yard, Norfolk, Va.
1892	Hake, William F.,	Maj. and Surg., M. S. T., 47 E. Bridge St., Grand Rapids, Mich.
1892	Halberstadt, George Howell,	Maj. and Surg., N. G., Pa., 218 Market St., Pottsville, Pa.
1891	Halley, George,	Maj. and Surg., N. G., Mo., 438 New Ridge Bldg., Kansas City, Mo.
1898	Hammond, Josiah Shaw,	Maj. and Surg., N. G., Mont., Butte, Mont.
1896	Hanson, G. F.,	Lt. Col. and Med. Dir., N. G., Cal., 3534 Mission St., San Francisco, Cal.
1895	Harland, William Guy Bryan,	Maj. and Surg., N. G., Pa., 1005 So. 47th St., Philadelphia, Pa.
1899	Harrelson, Nathan O.,	Maj. and Surg., 5th Mo. V. I., U. S. V., 517 Rialto Bldg., Kansas City, Mo.
1895	Harris, Henry Sutton Tarring,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1894	Harvey, Norman Darrell,	Maj. and Surg., R. I. M., 260 Benefit St., Providence, R. I.
1894	Harvey, Philip Francis, <i>Editor, 1895-96.</i>	Maj. and Surg., U. S. A., San Francisco, Cal.
1893	Havard, Valery,	Maj. and Surg., U. S. A., Santiago, Cuba.

ELECTED.

- 1898 Hayes, Robert G. H., Lt. and Asst. Surg., 5th Pa. V. I., U. S. V.,
11 Spring St., Bellefonte, Pa.
- 1896 Heizmann, Charles Lawrence, Maj. and Surg., U. S. A.,
San Antonio, Tex.
- 1892 Henderson, George, Maj. and Surg. Gen., N. G., D. C.,
817 T St., N. W., Washington, D. C.
- 1892 Hendley, Frank W., Maj. and Surg., O. N. G.,
785 E. McMillan St., Cincinnati, O.
- 1891 Henry, Nelson H., Col. and Asst. Surg. Gen., N. G. S. N. Y.,
First Vice-Pres., 1891-93.
14 E. 10th St., New York, N. Y.
- 1896 Hersey, Freeman Clark, Lt. Col. and Med. Dir., M. V. M.,
96 Huntington Ave., Boston, Mass.
- 1897 Hobbs, Wilbert A., Capt. and Asst. Surg., O. N. G.,
East Liverpool, O.
- 1895 Hodgman, Alfred Frederick, 1st Lt. and Asst. Surg., N. G. S. N. Y.,
Auburn, N. Y.
- 1891 Hoff, John Van Rensselaer, Maj. and Surg., U. S. A.,
First Vice-Pres., 1897-98.
San Juan, Porto Rico.
Second Vice-Pres., 1896-97.
- 1896 Hoffman, John Raymond, Capt. and Asst. Surg., I. N. G.,
63 Wabash Ave., Chicago, Ill.
- 1893 Hooper, Henry, Ex-Capt. and Asst. Surg., I. N. G.,
541 N. State St., Chicago, Ill.
- 1896 Hopkins, William Evelyn, Col. and Surg. Gen., N. G., Cal.,
803 Sutter St., San Francisco, Cal.
- 1892 Hough, Charles Pinckney, Ex-Brig. Gen. and Surg. Gen., N. G.,
Mont.,
415 Atlas Bldg., Salt Lake City, Utah.
- 1895 Howard, Deane Childs, Capt. and Asst. Surg., U. S. A.,
Fort Hancock, N. J.
- 1897 Huddleston, John Henry, Capt. and Asst. Surg., N. G. S. N. Y.,
126 W. 85th St., New York, N. Y.
- 1899 Huidekoper, Rush Shippen, Lt. Col. and Chief Surg., U. S. V.,
Army and Navy Club, 16 W. 31st St.,
New York, N. Y.
- 1899 Hutchings, R. K., Lt. and Asst. Surg., N. G., Colo.,
Colorado Springs, Colo.
- 1896 Hyde, James Nevins, Lt. N. R., Ill.; Ex-P. A. Surg., U. S. N.,
100 State St., Chicago, Ill.
- 1894 Ives, Francis Joseph, Capt. and Asst. Surg., U. S. A.,
Matanzas, Cuba.
- 1894 Izlar, Robert P., 1st Lt. and Asst. Surg., S. T., Fla.,
Waycross, Ga.
- 1899 Jackson, Charles Warren, Lt. and Asst. Surg., N. G. S. N. Y.,
130 W. 81st St., New York, N. Y.
- 1894 Jackson, Jabez North, Capt. and Asst. Surg., N. G., Mo.,
413 Rialto Bldg., Kansas City, Mo.
- 1892 Jarrett, Arthur R., Capt. and Asst. Surg., N. G. S. N. Y.,
95 Halsey St., Brooklyn, N. Y.
- 1895 Jarvis, Nathan Sturges, Lt. Col. and Asst. Surg. Gen., N. G. S. N. Y.; Ex-Capt. and Asst. Surg.,
U. S. A.,
142 Madison Ave., New York, N. Y.
- 1897 Jenne, James N., Brig. Gen. and Surg. Gen., Vt.,
130 Main St., St. Albans, Vt.

ELECTED.

1894	Johnston, James,	Maj. and Surg., N. G., Pa., Bradford, Pa.
1896	Johnston, William G.,	1st Lt. and Asst. Surg., N. G., Pa., Titusville, Pa.
1895	Johnston, William McCandless,	Maj. and Surg., N. G., Pa. Sewickly, Pa.
1899	Jones, George H.,	Lt. and Asst. Surg., 10th O. V. I., 2304 Franklin Ave., Toledo, O.
1897	Jordan, Charles Simonton,	Capt. and Asst. Surg., S. G., N. C., Asheville, N. C.
1892	Kaufman, Franklin John,	1st Lt. and Asst. Surg., N. G. S. N. Y., 311 W. Genesee St., Syracuse, N. Y.
1896	Kean, Jefferson Randolph,	Capt. and Asst. Surg., U. S. A., Quemados, Cuba.
1893	Keefer, Frank R.,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1899	Keller, J. M.	Col. and Surg. Gen., N. G., Ark., Hot Springs, Ark.
1897	Kemble, Lewis Hasbrouck,	Maj. and Surg., N. G., Colo., Aspen, Colo.
1898	Kemp, Franklin M.,	1st Lt. and Asst. Surg., U. S. A., West Point, N. Y.
1898	Kendall, Francis Drake,	Maj. and Surg., S. C. V. T., 1309 Plain St., Columbia, S. C.
1897	Kendall, William Pratt,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1897	Kennedy, Robert Morris,	P. A. Surg. (Lt. j. g.), U. S. N., Care Navy Dept., Washington, D. C.
1895	Kenyon, George Henry,	Brig. Gen. and Surg. Gen., R. I. M., 123 N. Main St., Providence, R. I.
1895	Kilbourne, Henry Sayles,	Maj. and Surg., U. S. A., Army Bldg., New York, N. Y.
1895	Kimball, James P.,	Maj. and Surg., U. S. A., Fort Columbus, New York, N. Y.
1898	Kingston, Robert J.,	1st Lt. and Asst. Surg., N. G. S. N. Y., 185 Grand St., Newburgh, N. Y.
1895	Kneedler, William L.,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1896	Kulp, John Stewart,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1896	Kuyk, Dirk Adrian,	Maj. and Surg., Va. V., 4 W. Grace St., Richmond, Va.
1895	Lacey, Irving E.,	Capt. and Asst. Surg., N. G., Wis., Niellsville, Wis.
1891	La Garde, Louis A.,	Maj. and Surg., U. S. A., Soldiers' Home, Washington, D. C.
1893	La Pierre, Julian,	Maj. and Surg., N. G., Conn., 220 Central Ave., Norwich, Conn.
1896	Leach, Philip,	Surg. (Lt.), U. S. N., Surg. Asiatic Station, Care Navy Dept., Washington, D. C.
1898	Ledeboer, Francois S.,	1st Lt. and Asst. Surg., N. G., S. D., Spearfish, S. Dak.
1895	Lee, Edward Wallace,	Col. and Surg. Gen., N. G., Neb., 315 S. 15th St., Omaha, Neb.
1893	Lee, Simeon Lemuel,	Col. and Surg. Gen., Nev., Carson, Nev.

ELECTED.

1896	Lincoln, Frank T.,	Maj. and Med. Insp., Ga. V., 144 Taylor St., Savannah, Ga.
1894	Lippincott, Henry,	Lt. Col. and Dep. Surg. Gen., U. S. A., Denver, Colo.
1898	Lippitt, William Fontaine,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1891	Little, Frederick H.,	Brig. Gen. and Surg. Gen. (Ret.), N. G., Ia., 116 W. 2d St., Muscatine, Ia.
1892	Longshore, William R.,	Maj. and Surg., N. G., Pa., 71 Church St., Hazelton, Pa.
1897	Lowes, Joseph E.,	Brig. Gen. and Surg. Gen., O., Dayton, O.
1896	Lowndes, Charles Henry Tilgh-	P. A. Surg. (Lt. j. g.), U. S. N., Care Navy Dept., Washington, D. C.
1896	Lutz, Frank L.,	Brig. Gen. and Surg. Gen., Mo., 3337 Lafayette St., St. Louis, Mo.
1895	McCandless, Alexander A. E.,	Lt. Col. and Surg.-in-Chief, N. G., Pa., Pittsburgh, Pa.
1895	McCarthy, William Daniel,	Maj. and Surg., N. G., Cal., 111 Eddy St., San Francisco, Cal.
1894	McCaw, William J.,	Maj. and Surg., R. I. M., 222 Benefit St., Providence, R. I.
1899	McComb, J. Baldwin,	Capt. and Asst. Surg., O. N. G., 217 E. State St., Columbus, O.
1898	McCord, Thomas Chester,	Maj. and Surg., 4th Ill. I., U. S. V., Paris, Ill.
1894	McDill, John R.,	Capt. and Asst. Surg., N. G., Wis., 200 Wisconsin St., Milwaukee, Wis.
1891	McKinstry, Howard L.,	Maj. and Surg., N. G., Minn., Main St., Redwing, Minn.
1891	Mann, Alban L.,	Maj. and Surg. (Ret.), I. N. G., 214 Chicago St., Elgin, Ill.
1891	Marion, Otis H.,	Lt. Col. and Med. Dir., M. V. M., 22 Harvard Ave., Allston Station, Boston, Mass.
1894	Marmion, Robert Augustine,	Med. Dir. (Capt.), U. S. N., Naval Hospital, Philadelphia, Pa.
1895	Marsh, William H.,	Act. Asst. Surg., U. S. M. H. S., Solomons, Md.
1893	Martin, Edward,	Maj. and Surg., N. G., Pa., 415 S. 15th St., Philadelphia, Pa.
1894	Mason, Charles Field,	Capt. and Asst. Surg., U. S. A., Manila, P. I.
1896	Matthews, Willard S. H.,	Maj. and Surg., N. G., Ia., Des Moines, Ia.
1895	Maus, Louis Mervin,	Maj. and Surg., U. S. A., Manila, P. I.
1898	Maybury, William Jordan,	Col. and Surg. Gen., Me., Saco, Me.
1897	Mayer, Daniel,	Brig. Gen. and Surg. Gen., W. Va., Charleston, W. Va.
1895	Mead, Harry,	Capt. and Asst. Surg., N. G. S. N. Y., 758 Elmwood Ave., Buffalo, N. Y.
1894	Merrill, James C.,	Maj. and Surg., U. S. A., Washington, D. C.

ELECTED.

1895 Meyer, Robert C. J.,	Asst. Surg. (Ensign), Ill. N. R., Moline, Ill.
1895 Middleton, Johnson Van Dyke,	Lt. Col. and Dep. Surg. Gen., U. S. A., (Ret.), Occidental Hotel, San Francisco, Cal.
1891 Miller, Truman W.,	Maj. and Surg., I. N. G., 612 Reliance Bldg., Chicago, Ill.
1900 Milligan, Samuel Cargill,	Maj. and Surg., N. G., Pa., 609 Smith Block, Pittsburgh, Pa.
1896 Mills, George Westgate,	Maj. and Surg., M. V. M., 60 Salem St., Medford, Mass.
1896 Mood, J. A.,	Col. and Surg. Gen., S. C., Sumter, S. C.
1895 Moore, Henry McI. W.,	Maj. and Surg., O. N. G., 243 E. Town St., Columbus, O.
1895 Morris, Lewis,	P. A. Surg. (Lt. j. g.), U. S. N., Care Navy Dept., Washington, D. C.
1898 Morris, Lewis Coleman,	Capt. and Asst. Surg., N. G., Ala., Chalifaux Bldg., Birmingham, Ala.
1898 Morse, William E. H.,	Capt. and Asst. Surg., N. G., Ia., Algona, Kossuth Co., Ia.
1895 Mudge, Selden Johnson,	1st. Lt. and Asst. Surg., N. G. S. N. Y., Union St., Olean, N. Y.
1894 Murray, Robert Drake,	Surg., U. S. M. H. S., Key West, Fla.
1891 Myers, Charles F. W.,	Lt. Col. and Med. Dir., N. G., N. J., 108 Broadway, Paterson, N. J.
1896 Neff, George W.,	Maj. and Surg., N. G., Pa., Matontown, Fayette Co., Pa.
1894 Newgarden, George J.,	Capt. and Asst. Surg., U. S. A., Fort McHenry, Md.
1896 Norton, Oliver Dwight,	Surg. (Lt.), U. S. N., Care Navy Dept., Washington, D. C.
1892 O'Neill, James Wilks,	Maj. and Surg., N. G., Pa. (Ret.), 2110 Spruce St., Philadelphia, Pa.
1897 Osborn, Arthur Leland,	Maj. and Surg., O. N. G., Norwalk, O.
1892 Owen, William Otway,	Capt. and Asst. Surg., U. S. A., Fort Thomas, Ky.
1894 Parker, William James,	Maj. and Surg., N. G., N. J., 418 Bergen Ave., Jersey City, N. J.
1895 Parkhill, Clayton,	Col. and Surg. Gen. (Ret.), N. G., Colo., McPhee Bldg., Denver, Colo.
1896 Peck, George,	Med. Dir. (Capt.), (Ret.), U. S. N., 926 N. Broad St., Elizabeth, N. J.
1900 Peck, O. W.,	Surg. Gen., Vt., Winooski, Vt.
1897 Peckham, Charles F.,	Lt. and Surg., N. B., R. I., 176 Benefit St., Providence, R. I.
1892 Peckham, Cyrus T.,	Surg., U. S. M. H. S., Galveston, Tex.
1897 Penrose, George H.,	Col. and Surg. Gen., N. G., Utah, Salt Lake City, Utah.
1895 Percy, Henry Tucker,	Surg. (Lt.), U. S. N., Navy Yard, Norfolk, Va.
1894 Perley, Henry Otis,	Maj. and Surg., U. S. A., Manila, P. I.

ELECTED.

- 1896 Persons, Remus Charles, Med. Insp. (Com'd'r), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1897 Pesold, Carl, Capt. and Asst. Surg., N. G., Mo.,
1502 Wagoner Pl., St. Louis, Mo.
- 1896 Pettigrew, George Atwood, Col. and Surg. Gen., N. G., S. D.,
Flandreau, S. Dak.
- 1897 Phillips, Albert William, Brig. Gen. and Surg. Gen. (Ret.), Conn.,
Derby, Conn.
- 1895 Phillips, Frank I., Act. Asst. Surg., U. S. M. H. S.,
Escanaba, Mich.
- 1894 Phillips, John Leighton, Capt. and Asst. Surg., U. S. A.,
73 Hanover St., Boston, Mass.
- 1895 Pigott, Michael Royston, P. A. Surg. (Lt. j. g.), U. S. N.,
U. S. Naval Academy, Annapolis, Md.
- 1900 Pleadwell, Frank Lester, Asst. Surg. (Lt. j. g.), U. S. N.,
Bureau Med. and Surg., Washington,
D. C.
- 1895 Poindexter, Jefferson Dudley, Capt. and Asst. Surg., U. S. A.,
Fort Reno, Okla.
- 1897 Pope, Benjamin Franklin, Lt. Col. and Dep. Surg. Gen., U. S. A.,
San Francisco, Cal.
- 1897 Porter, Alexander Shaw, Capt. and Asst. Surg. (Ret.), U. S. A.,
Redlands, Cal.
- 1894 Porter, Joseph Y., Maj. and Surg., S. T., Fla.,
Jacksonville, Fla.
- 1894 Potteiger, Jonathan B., Maj. and Surg., N. G., Pa.,
Hamburg, Pa.
- 1894 Powell, Junius Levert, Maj. and Surg., U. S. A.,
Manila, P. I.
- 1899 Powell, Seneca Daniel, Maj. and Brig. Surg., N. G. S. N. Y.,
12 W. 40th St., New York, N. Y.
- 1894 Priestly, James Taggart, Brig. Gen. and Surg. Gen., Ia.,
707 E. Locust St., Des Moines, Ia.
- 1892 Pritchett, Gilbert L., Maj. and Surg., N. G., Neb.,
Fairbury, Neb.
- 1895 Purviance, W. E., Capt. and Asst. Surg., U. S. A.,
Vancouver Barracks, Wash.
- 1895 Pyles, Richard A., Capt. and Asst. Surg., N. G., D. C.,
Anacostia, Washington, D. C.
- 1900 Ralston, B. Stewart, 1st Lt. and Asst. Surg., N. G., Pa.,
Penn Ave. and Main St., Pittsburg,
Pa.
- 1897 Rannels, David A., Capt. and Asst. Surg., O. N. G.,
McArthur, O.
- 1900 Raymond, Henry I., Capt. and Asst. Surg., U. S. A.,
Pullman Bldg., Chicago, Ill.
- 1892 Read, Louis W., Col. and Surg. Gen., N. G., Pa.,
Norristown, Pa.
President, 1895-96.
First Vice-Pres., 1894-95.
Second Vice-Pres., 1893-94.
- 1898 Reed, Robert Harvey, Col. and Surg. Gen., Wyo.,
Rock Springs, Wyo.
- 1849 Reed, Walter, Maj. and Surg., U. S. A.,
Surg. Gen's. Office, Washington,
D. C.
- 1894 Reynolds, Frederick P., Capt. and Asst. Surg., U. S. A.,
Manila, P. I.

ELECTED.

- 1896 Rhein, John Henry Wallace, Asst. Surg. (Lt. j. g.), S. N. M., Pa.,
1330 Spruce St., Philadelphia, Pa.
- 1898 Rhoads, Thomas Leidy, Asst. Surg., U. S. N.,
Boyertown, Pa.
- 1899 Richard, Charles, Maj. and Surg., U. S. A.,
Fort Leavenworth, Kan.
- 1896 Richards, Theodore W., P. A. Surg. (Lt. j. g.), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1895 Richardson, William Lambert, Lt. Col. and Surg., M. V. M.,
225 Commonwealth Ave., Boston,
Mass.
- 1897 Rieg, Philip S., Ens. and Asst. Surg., N. D., O. N. G.,
338 Summit St., Toledo, O.
- 1896 Ritter, F. Horace S., 1st Lt. and Asst. Surg., N. G. S. N. Y.,
314 E. Church St., Elmira, N. Y.
- 1895 Rixey, Presley Marion, Surg. (Lt.), U. S. N.,
Naval Dispensary, Washington, D. C.
- 1898 Roberts, Thomas Elmer, Capt. and Asst. Surg., I. N. G.,
144 S. Oak Park Ave., Oak Park, Ill.
- 1891 Robertson, Charles Moore, Maj. and Surg., N. G. I.,
Davenport, Ia.
- 1893 Robins, Robert Patterson, 1st Lt. and Asst. Surg., N. G. Pa.,
2110 Pine St., Philadelphia, Pa.
- 1896 Rockwell, Thomas F., Maj. and Surg., N. G., Conn.,
Rockville, Conn.
- 1894 Rolfe, William Alfred, 1st Lt. and Asst. Surg., M. V. M.,
249 West Newton St., Boston, Mass.
- 1895 Sawtelle, Henry W., Surg., U. S. M. H. S.,
Chicago, Ill.
- 1894 Schuyler, Clarkson C., 1st Lt. and Asst. Surg. (Ret.), N. G. S.
N. Y.,
Plattsburg, N. Y.
- 1894 Scofield, Walter Keeler, Med. Dir. (Capt.), U. S. N.,
Philadelphia, Pa.
- 1896 Seaman, Gilbert E., Capt. and Asst. Surg., N. G., Wis.,
315 Goldsmith Bldg., Milwaukee,
Wis.
- 1893 Sevey, Harry Sheldon, Capt. and Asst. Surg. (Ret.), N. G., S.
D.,
Arizpe, Sonora, Mexico.
- 1894 Shannon, William C., Maj. and Surg., U. S. A. (Ret.),
Phoenix, Ariz.
- 1894 Shaw, John Bliss, Maj. and Surg., I. N. G.,
Joliet, Ill.
- 1896 Shipp, Edward Mansfield, P. A. Surg. (Lt. j. g.), U. S. N.,
Naval Hospital, Norfolk, Va.
- 1899 Shoemaker, John Veitch, Col. and Surg. Gen., Pa.,
1519 Walnut St., Philadelphia, Pa.
- 1892 Silliman, James E., Maj. and Surg., N. G., Pa.,
137 West 8th St., Erie, Pa.
- 1896 Simpson, James Edwin, Maj. and Surg., M. V. M.,
348 Essex St., Salem, Mass.
- 1897 Skene, William H., 1st Lt. and Asst. Surg., N. G. S. N. Y.,
143 Clinton St., Brooklyn, N. Y.
- 1894 Skinner, John O., Maj. and Surg. (Ret.), U. S. A.,
Chambersburg, Pa.

ELECTED.

- 1893 Smart, Charles,
Lt. Col. and Dep. Surg. Gen., U. S. A.,
2017 Hillyer Place, Washington,
D. C.
- 1895 Smith, Allen V.,
Capt. and Asst. Surg., O. N. G.,
Canton, O.
- 1895 Smith, French W.,
1st Lt. and Asst. Surg., N. G., W. Va.,
Bluefield, W. Va.
- 1895 Smith, George Tucker,
P. A. Surg. (Lt. j. g.), U. S. N.,
Naval Laboratory, Brooklyn, N. Y.
- 1898 Smith, R. K.,
P. A. Surg. (Lt. j. g.), U. S. N.,
Navy Yard, Mare Island, San Francisco, Cal.
- 1893 Smith, William Lloyd,
Maj. and Surg., I. N. G.,
306 S. Park St., Streator, Ill.
- 1897 Srodes, J. Lewis,
1st Lt. and Asst. Surg., N. G., Pa.,
742 Penn Ave., Wilkinsburg, Pa.
- 1893 Standish, Myles,
Capt. and Com. Amb. Corps, M. V. M.,
6 St. James Ave., Boston, Mass.
- 1898 Stanton, Samuel Cecil,
1st Lt. and Asst. Surg., I. N. G.,
9 Cedar St., Chicago, Ill.
- 1897 Stark, William T.,
Capt. and Asst. Surg., N. G., Mo.,
Kansas City, Mo.
- 1894 Stayer, Andrew Snowberger,
Maj. and Surg., N. G., Pa.,
1501 Seventh Ave., Altoona, Pa.
- 1898 Stedman, Joseph Cyrus,
2d Lt. Amb. Corps, M. V. M.,
116 Sedgwick St., Boston, Mass.
- 1895 Steeley, Oscar B.,
Col. and Surg. Gen., Ida.,
Pocatello, Ida.
- 1897 Stephenson, Franklin Bache,
Surg. (Lt.), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1897 Stephenson, William,
Capt. and Asst. Surg., U. S. A.,
Army Bldg., New York, N. Y.
- 1893 Sternberg, George Miller,
Brig. Gen. and Surg. Gen., U. S. A.,
Washington, D. C.
- 1898 Stewart, Edward Larkin,
1st Lt. and Asst. Surg., F. S. T.,
Starke, Fla.
- 1895 Stewart, Walter Scott,
1st Lt. and Asst. Surg., N. G., Pa.,
52 S. Franklin St., Wilkesbarre, Pa.
- 1894 Stiles, Henry Ranney,
Capt. and Asst. Surg., U. S. A.,
Madison Barracks, New York.
- 1896 Stitt, Edward R.,
P. A. Surg. (Lt.), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1899 Stone, Alexander J.,
Brig. Gen. and Surg. Gen., N. G., Minn.,
Lowry Arcade, St. Paul, Minn.
- 1899 Stover, Bruce H.,
Lt. and Asst. Surg., N. G., Ia.,
Carroll, Ia.
- 1891 Streeter, John Williams,
Lt. Col. and Asst. Surg. Gen., I. N. G.,
2646 Calumet Ave., Chicago, Ill.
- 1897 Stroud, Harrison Edward,
Col. and Surg. Gen., Ariz.,
Phoenix, Ariz.
- 1896 Sullivan, Thomas J.,
Maj. and Surg., I. N. G.,
4709 Michigan Ave., Chicago, Ill.
- 1896 Taneyhill, G. Lane,
Maj. and Surg. (Ret.), N. G., Md.,
1103 Madison Ave., Baltimore, Md.
- 1894 Taylor, Walter L.,
Ex-Capt. and Asst. Surg., O. N. G.,
933 Grand Ave., Price Hill, Cincinnati, O.

ELECTED.

1892	Terriberry, George W.,	Col. and Div. Surg., N. G., N. J., 146 Broadway, Paterson, N. J.
1895	Terry, Marshall Orlando,	Brig. Gen. and Surg. Gen., N. G. S. N. Y., 196 Genesee St., Utica, N. Y.
1895	Tesson, Louis S.,	Maj. and Surg., U. S. A., Fort Ethan Allen, Vt.
1893	Thayer, Frederick C.,	Col. and Surg. Gen., Me. V. M., 119 Maine St., Waterville, Me.
1893	Thomson, Archibald G.,	1st Lt. and Asst. Surg., N. G., Pa., 1426 Walnut St., Philadelphia, Pa.
1900	Thomson, Hiram Benson,	Maj. and Surg., N. G., Conn., New London, Conn.
1895	Tilton, Henry Remsen,	Lt. Col. and Dep. Surg. Gen., U. S. A., 17 S. 21st St., Philadelphia, Pa.
1899	Torney, George H.,	Maj. and Surg., U. S. A., Army and Navy General Hospital, Hot Springs, Ark.
1899	Townsend, Joseph Hendley,	Maj. and Surg., N. G., Conn., 39 College St., New Haven, Conn.
1900	Trecartin, David Munson,	Ens. and Asst. Surg., N. B., N. G., Conn., 352 State St., Bridgeport, Conn.
1894	Tuholske, Herman,	Maj. and Surg., N. G., Mo., 410 N. Jefferson St., St. Louis, Mo.
1893	Turnbull, Charles Smith,	Ex-Maj. and Surg., N. G., Pa., 1719 Chestnut St., Philadelphia, Pa.
1896	Turner, William D.,	Maj. and Surg., Va. V., Fergusson's Wharf, Va.
1895	Tuttle, Jay,	Actg. Asst. Surg., U. S. M. H. S., Astoria, Ore.
1894	Twitchell, Herbert Eugene,	Capt. and Asst. Surg., O. N. G., 24 S. B St., Hamilton, O.
1896	Vaughan, Bolivar Alvearr,	Lt. Col. and Asst. Surg. Gen., N. G., Miss., Columbus, Miss.
1897	Von Wedekind, Luther Lockman,	P. A. Surg. (Lt. j. g.), U. S. N., Care Navy Dept., Washington, D. C.
1895	Wakeman, William James,	Capt. and Asst. Surg., U. S. A., Fort Thomas, Ky.
1894	Wallace, David L.,	Maj. and Surg., N. G., N. J., 192 Clinton Ave., Newark, N. J.
1896	Wallace, Henry,	Capt. and Asst. Surg., N. G. S. N. Y., 183 Congress St., Brooklyn, N. Y.
1899	Walls, Charles Bruce,	1st Lt. and Asst. Surg., I. N. G., 1003 Warren Ave., Chicago, Ill.
1896	Ward, John M. Broomall,	1st Lt. and Asst. Surg., N. G., Pa., Quarantine Station, Marcus Hook, Pa.
1899	Ward, Milo Buel,	Maj. and Brig. Surg., U. S. V., Kansas City, Mo.
1897	Warfield, Ridgely Brown,	Brig. Gen. and Surg. Gen., Md., 214 W. Franklin St., Baltimore, Md.
1892	Warren, Frank Sumner,	Maj. and Surg., Me. V. M., 17 South St., Biddeford, Me.
1896	Waters, William E.,	Lt. Col. and Dep. Surg. Gen. (Ret.), U. S. A., Care Surg. Gen., U. S. A., Washing- ton, D. C.

ELECTED.

1893	Watson, Wilbur S.,	Lt. Col. and Med. Dir., N. G., Conn., 66 West St., Danbury, Conn.
1896	Weaver, Clarence A.,	Capt. and Surg., N. G., D. C., 1614 Q St., N. W., Washington, D. C.
1892	Weaver, Joseph K.,	Maj. and Surg., N. G., Pa., Norristown, Pa.
1896	Weaver, William G.,	1st Lt. and Asst. Surg., N. G., Pa., Wilkesbarre, Pa.
1894	Wedge, Albert Clark,	Lt. Col. and Asst. Surg. Gen., N. G., Minn., Albert Lea, Minn.
1893	Wertebaker, Chas. Poindexter,	P. A. Surg., U. S. M. H. S., Wilmington, N. C.
1897	Westervelt, William Alfred, <i>Asst. Secretary, 1897-98.</i>	Maj. and Surg., O. N. G., 62 E. Broad St., Columbus, O.
1891	Wheaton, Charles A.,	Brig. Gen. and Surg. Gen. (Ret.), Minn., 326 Wabasha St., St. Paul, Minn.
1897	Wheaton, James Lucas,	1st Lt. Hosp. Corps. R. I. M., Summer St., Pawtucket, R. I.
1899	Whitcomb, Edward H.,	Maj. and Asst. Surg. Gen., N. G., Minn., 199 E. 7th St., St. Paul, Minn.
1899	White, Wm. Seymour,	1st Lt. and Asst. Surg., I. N. G., 370 Warren Ave., Chicago, Ill.
1897	Wieber Francis William Fer- dinand.	Surg. (Lt.), U. S. N., San Juan, Porto Rico.
1891	Wilkie, Frederick J.,	Maj. and Surg., N. G., Wis., 61 Merritt St., Oshkosh, Wis.
1897	Willard, William G.,	Maj. and Surg., I. N. G., 544 Washington Boul., Chicago, Ill.
1895	Willcox, Charles,	Capt. and Asst. Surg., U. S. A., Fort Sam Houston, Tex.
1897	Williams, John Hey,	Col. and Surg. Gen., N. C., 53 Haywood St., Asheville, N. C.
1897	Wilson, Charles E.,	Capt. and Asst. Surg., N. G., Mo., 906 Main St., Kansas City, Mo.
1898	Wilson, George B.,	P. A. Surg. (Lt. j. g.), U. S. N., Care Navy Dept., Washington, D. C.
1897	Wilson, James Sprigg,	1st Lt. and Asst. Surg., U. S. A., Manila, P. I.
1894	Wilson, John S.,	1st Lt. and Asst. Surg., N. G. S. N. Y., 29 Garden St., Poughkeepsie, N. Y.
1896	Wilson, William E.,	Maj. and Surg., R. I. M., 20 Park Place, Pawtucket, R. I.
1891	Wilson, William W.,	Ex.-Capt. and Asst. Surg., Ind. Inf. Le- gion, 620 3d St., Wausau, Wis.
1894	Wise, John Cropper, <i>Second Vice-Pres., 1897-98.</i>	Med. Insp. (Comdr.), U. S. N., Care Navy Dept., Washington, D. C.
1896	Wood, Frederick John Jennings,	Maj. and Surg., N. G. S. N. Y., 199 DeKalb Ave., Brooklyn, N. Y.
1895	Wood, Marshall William,	Maj. and Surg., U. S. A., Jefferson Barracks, Mo.
1894	Woodhull, Alfred Alexander,	Lt. Col. and Dep. Surg. Gen., U. S. A., Manila, P. I.
1893	Woodruff, Charles Edward,	Capt. and Asst. Surg., U. S. A., Fort Riley, Kan.

ELECTED.

1896	Woodruff, Ezra,	Maj. and Surg., U. S. A., Fort Hamilton, New York.
1896	Woods, George Worth,	Med. Dir. (Capt.), U. S. N., U. S. Naval Hospital, Brooklyn, N. Y.
1898	Wright, Arthur Lee,	Maj. and Surg., N. G. Ia., Carroll, Ia.
1899	Wright, John William,	Lt. and Asst. Surg., N. G. Pa., 18 E. 8th St., Erie, Pa.
1894	Wyeth Marlborough Churchill,	Maj. and Surg., U. S. A., Havana, Cuba.
1898	Wylie, Winfred,	Col. and Surg. Gen., Ariz., Phoenix, Ariz.
1894	York, George William,	Maj. and Surg., N. G. S. N. Y., 190 Franklin St., Buffalo, N. Y.

ASSOCIATE MEMBERS.

ELECTED.

1899	Adams, W. A.,	Late Lt. Col. and Med. Dir., Tex. V. G., Equitable Bldg., St. Louis, Mo.
1897	Asch, Morris J.,	Ex-Maj. and Surg., U. S. A., 5 W. 30th St., New York, N. Y.
1898	Board of Officers,	65th Regt., N. G. S. N. Y., Buffalo, N. Y.
1896	Bradfield, George Milton,	Ex-1st Lt. and Asst. Surg., U. S. V., 1230 Spring Garden St., Philadelphia, Pa.
1897	Conner, Phineas S.,	Ex-Bvt. Maj. and Asst. Surg., U. S. A., 215 W. 9th St., Cincinnati, O.
1894	Donnelly, Richard A.,	Brig. Gen. and Q. M. Gen., N. J., Trenton, N. J.
1896	Fife, George Storrs,	Ex-Asst. Surg. (Lt.), U. S. N., 1201 California St., San Francisco, Cal.
1900	Goetz, Wolfgang,	Maj. and Surg. (Ret.), N. G. S. N. Y., Altonau, Haniburg, Germany.
1899	Grothan, Ole,	Late Maj. and Surg., 3d Neb. V. I., St. Paul, Neb.
1896	Grove, John H.,	Ex-Bvt. Lt. Col. and Surg., U. S. V., 1504 Arch St., Philadelphia, Pa.
1897	Hamilton, Charles S.,	Ex-Capt. and Asst. Surg., O. N. G., 142 E. Long St., Columbus, O.
1897	Harris, George,	Maj., N. G., D. C., Washington, D. C.
1897	Hart, Hugh A.,	Ex-Brig. Gen. and Surg. Gen., O., Wooster, O.
1899	Hunter, Randall R.,	Late Maj. and Brig. Surg., U. S. V., Fulton, Kan.
1900	Le Seure, Oscar,	Late Maj. and Brig. Surg., U. S. V., 32 Adams St., Detroit, Mich.
1898	Liebich, Arthur K. A.,	Maj., 5th Infy., O. N. G., 80 Euclid Ave., Cleveland, O.
1897	Loving, Starling,	Ex-Maj. and Surg., O. V. I., 229 E. State St., Columbus, O.
1897	Manley, Thomas H.,	Ex-Capt. and Asst. Surg., U. S. V., 115 W. 49th St., New York, N. Y.

ELECTED.

1899	Martin, Frank H.,	1st Lt. and Asst. Surg., U. S. V., Topeka, Kan.
1892	Moore, Milton,	Brig. Gen. Comdg. 1st Brig., N. G., Mo., New York Life Bldg., Kansas City, Mo.
1896	Morris, Henry.	Ex-1st Lt. and Asst. Surg., N. G., Pa., 313 S. 16th St., Philadelphia, Pa.
1900	Murray, Frank W.,	Maj. and Surg. (Ret.), N. G. S. N. Y., 37 W. 39th St., New York, N. Y.
1896	Osgood, Frederick Huntington,	1st Lt. and Vet. Surg., M. V. M., 50 Village St., Boston, Mass.
1894	Sander, Enno,	Ex-Maj., N. G., Mo., 129 S. 11th St., St. Louis, Mo.
1899	Southard, Wm. Freeman,	Late Maj. and Surg., 2d Corps, Mass. Cadets, 1220 Sutter St., San Francisco, Cal.
1894	Spencer, B. W.,	Brig. Gen. and Insp. Gen., N. G., N. J., Passaic, N. J.
1899	Trader, John W.,	Late Maj. and Surg., N. G., Mo., Sedalia, Mo.
1894	Truax, Charles,	44 Wabash Ave., Chicago, Ill.
1896	Van Pelt, Joseph K. T.,	Ex-Maj. and Brig. Surg., U. S. V., 1529 Spruce St., Philadelphia, Pa.
1896	Wagner, Clinton,	Ex-Bvt. Lt. Col. and Surg., U. S. A., 19 E. 38th St., New York, N. Y.
1897	Whitaker, Hervey Williams,	Ex-P. A. Surg. (Lt.), U. S. N., 72 Grant Ave., Columbus, O.
1896	Younger, William J.,	Ex-Col. and Med. Dir., N. G., Cal., 200 Stockton St., San Francisco, Cal.

CORRESPONDING MEMBERS.

ELECTED.

1899	W. Mitchell Banks, M. D., F. 28 Rodney St., Liverpool, England. R. C. S.	
1899	Surgeon-Lt. Col. Fred W. Bor-	Minister of Militia and Defence for den. Canada, Ottawa, Canada.
1897	General Epifanio Cacho,	General Jefe del Cuerpo Medico Militar Mexicano, (Surgeon General, Mexican Army), Ciudad Mexico, Mexico.
1897	Captain Hans Daal,	Sanitary Captain, Norwegian Army, Christiania, Norway.
1892	Medicinalrad Edvard Martin Ed-	Ofverfaltlakare vid armeen. holm, (Surgeon General, Swedish Army), Stockholm, Sweden.
1897	Surgeon-Captain Rory Fletcher,	Surgeon Captain, Central London Rangers, Groome, Streatham Park, London, S. W., England.
1892	General Thien Ho,	Medical Inspector General, Siamese Army, Bangkok, Siam.
1897	Docent Dr. Otokar Kukula.	K. K. Assistenzarzt, (Asst. Surg., Austro-Hungarian Army), Prague, Austro-Hungary.

ELECTED.

- 1897 Coronel Fernando Lopez, Coronel Medico Ciruj., Director Hosp. de Mexico, (Col. and Director Hospital of Instruction, Mexican Army), Ciudad Mexico, Mexico.
- 1899 Surgeon-Colonel William Mc-Watters, R. A. M. C. Halifax, Nova Scotia.
- 1899 Lt. Cor. Zacarias R. Molina. Surgeon in Charge, Military Hospital, Vera Cruz, Mexico.
- 1896 Professor Nicolaysen, University of Norway, Christiania, Norway.
- 1897 General William Silver Oliver, Deputy Surgeon General, British Army Medical Dept., 127 S. Park St., Halifax, N. S.
- 1892 Sir J. O'Neil, C. B., Surgeon General (Ret.), Indian Medical Service, London, England.
- 1892 Dr. Adolph Alexandrovitch Remert, Inspecteur Général de Service de Santé Militaire, Inginnernaia and Bolchaia Sadovaia Streets, St. Petersburg, Russia.
- 1899 Dr. Karl Rudberg, Staff Surgeon, Swedish Navy, Stockholm, Sweden.
- 1892 Surg.-Lt. Col. George Sterling Ryerson, Deputy Surgeon General, Canadian Militia, 60 College St., Toronto, Ontario.
- 1892 Generalmajor Johan Frederik Thaulow, Sanitetsgeneral og Chef, Kongelige, Regjerings Forsvars-Department, (Surgeon General Royal War Ministry), Christiania, Norway.
- 1899 Lt. Commander Dr. Tomat Suri, Surgeon Imperial Japanese Navy, Tokio, Japan.
- 1892 M. G. M. F. Vanderlinden, Inspecteur Général de Service de Santé Militaire, Saint-Josseten-Noode, Belgium.
- 1891 General Stabsarzt, Prof. Dr. von Beremann, Geheimer Med. Rath, (Surgeon General 1st Class—Brigadier General), Kriegs Ministeriums, Berlin, Germany.
- 1892 Excellenz, General Stabsarzt der Armee, Prof. Dr. von Coler, Chef der Medizinal Abtheilung des Kriegs Ministeriums, (Surgeon General German Army, Chief of the Medical Section of the War Ministry—Major General), Kriegs Ministeriums, Berlin, Germany.
- 1891 General Stabsarzt, Prof. Dr. F. von Esmarch, Geheimer Med. Rath, (Surgeon General 1st Class—Brigadier General), Kiel, Germany.
- 1892 General Stabsarzt, Dr. von Fichte, Chef der Med. Abtheilung im Königl. Württembergischen Kriegs Ministeriums, (Surgeon General 1st Class, Chief of the Medical Section of the Royal Württemberg War Ministry), Stuttgart, Germany.
- 1892 Colonel Adolph Ziegler, Médecin en Chef de l'Armée Fédérale Suisse, Department Militaire, (Surgeon General of the Swiss Army), Berne, Switzerland.

HONORARY MEMBERS.

[In explanation of the presence in this list of gentlemen eligible to active membership, it may be stated that all such were elected prior to the adoption of the constitutional provision rendering them ineligible to honorary membership.]

ELECTED.

1899	Barton, Miss Clara,	President American National Red Cross Association, Glen Echo, Md.
1894	Book, James B.,	Lt. Col. and Surg. Gen. (Ret.), M. S. T., 33 Campau Bldg., Detroit, Mich.
1894	Brinton, John H.,	Late Surg., U. S. V., 1423 Spruce St., Philadelphia, Pa.
1895	Flint, Austin,	Late Surg. Gen., N. Y., 603 34th St., New York, N. Y.
1899	Gould, Miss Helen,	Irvington-on-Hudson, New York,
1891	Henrotin, Fernand,	Maj. and Surg. (Ret.), I. N. G., 353 La Salle Ave., Chicago, Ill.
1897	Humiston, William H.,	President Ohio State Medical Society, 122 Euclid Ave., Cleveland, O.
1891	Irwin, Bernard John Dowling,	Col. and Asst. Surg. Gen. (Ret.), U. S. A., Army Headquarters, Chicago, Ill.
1894	Keen, William Williams,	Late Act. Asst. Surg., U. S. A., 1729 Chestnut St., Philadelphia, Pa.
1892	Kimball, A. D.,	Maj. and Surg., Nat. Mil. Home, Ind., Marion, Ind.
1897	Kober, George M.,	Late Act. Asst. Surg., U. S. A., 1819 Q St., N. W., Washington, D. C.
1894	Love, Isaac Newton,	Lt. Col. and Med. Dir. (Ret.), N. G., Mo., Grand Ave., St. Louis, Mo.
1899	McGee, Dr. Anita Newcomb,	Late Director D. A. R. H. Corps; Act. Asst. Surg., U. S. A., 1620 P St., Washington, D. C.
1892	McIntyre, John H.,	Maj. and Surg. (Ret.), N. G., Ind., 710 Olive St., St. Louis, Mo.
1890	Merrill, Mrs. John F.,	President, San Francisco Red Cross Society, San Francisco, Cal.
1894	Mills, Hiram R.,	Lt. Col. and Surg. Gen. (Ret.), Mich., Port Huron, Mich.
1895	Moore, John,	Brig. Gen. and Surg. Gen. (Ret.), U. S. A., 903 16th St., N. W., Washington, D. C.
1895	Murray, Robert,	Brig. Gen. and Surg. Gen. (Ret.), U. S. A., 47 E. 28th St., New York, N. Y.
1895	Page, Charles,	Col. and Asst. Surg. Gen. (Ret.), U. S. A., 1216 Mount Royal Ave., Baltimore, Md.
1895	Park, Roswell,	Prof. of Surgery, University of Buffalo, 510 Delaware Ave., Buffalo, N. Y.

ELECTED.

1895 Smith, Joseph Rowe,	Col. and Asst. Surg. Gen. (Ret.), U. S. A., 2300 Delancey Pl., Philadelphia, Pa.
1895 Tryon, James Rufus,	Med. Dir. (Capt.), U. S. N., New York, N. Y.
1899 Walworth, Mrs. Ellen Hardin,	President Woman's National War Relief Association, 251 W. 88th St., New York, N. Y.
1896 Wilson, Ezra Herbert,	Director of the Hoagland Laboratory, 194 Keap St., Brooklyn, N. Y.
1892 Wyman, Walter,	Supervising Surg. Gen., U. S. M. H. S., Washington, D. C.

DECEASED MEMBERS.

ACTIVE MEMBERS.

*Adams, Charles W.,	Lt. and Asst. Surg., N. G., Mo.
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Index.

A	CTIVE Members	343
ALDEN, C. H., prefacing nominations for Honorary Membership	20	
Remarks of President-elect	23	
Remarks on First-Aid Dressing	17	
Roster of Volunteer Medical Officers Who Served During the Spanish-American War of 1898, in the Military and Naval Services	12, 56	
Discussion	12	
Amendments to Constitution	13, 19	
Apparatus for Sterilization of Water	148	
Appendicitis, Conversion from Conservatism to Early Surgical Interference in	18, 230	
Appendix	334	
Army Hospital Train During the Spanish-American War. C. Richard	18, 196	
Army, Women Nurses in	242	
ARNOLD, HERBERT A., The Canteen.....	218	
Associate Members	359	

B	ASSINI'S Operation for Radical Cure of Hernia—Seven Successful Cases, by George Worth Woods	13, 93
Bent-Knee Marching	175	
Black Vomit in Vera Cruz	290	
BORDEN, W. C., Conservatism in Military Surgery.....	250	
BRADFORD, E. H., Flexion or Bent-Knee Marching.....	15, 175	
BRIGGS, A. H., Resolutions Regarding J. E. Pilcher.....	21	
By-Laws	336	

C	ALEF, J. Francis, Physical Standards of National Guardsmen	13, 226
Canteen, The, H. A. Arnold	218	
Cavalry, Volunteer, Medical Officers.....	81	

CLARK, T. C., Amendment to Constitution.....	13
Resolutions	21
Committee, Auditing	11
Auditing, Report of	35
Executive, Report of	13, 20, 36
Nominating, Report of	15, 55
Of Arrangements, Report of	6, 14
On 'Enno Sander' Medal	18
On Girard's Paper	18
On Necrology	12
On Official Recognition of Badge, Report of	37
On Post Exchanges, Report of	42
On Transportation	18
Committees, Officers and	v
Reports of	24
Conservatism in Military Surgery, W. C. Borden	250
Conservatism in the Treatment of Appendicitis, My Conversion from, A. C. Girard	18, 230
Constitution, Amendments to	13, 19
And By-Laws	334
And By-Laws, Amendments to	30
Contract Surgeons, Army, Deaths Among	59
Conversion from Conservatism to Early Surgical Interference in Appendicitis, A. C. Girard	18, 230
Corresponding Members	360

D ALY, Wm. H., Discussion on Volunteer Medical Officers in the Spanish-American War	12
Deaths of Medical Officers of Army	58
of Volunteer Medical Officers of Army	58
of Volunteer Medical Officers of Navy	59
of Contract Surgeons, Army	59
Deceased Members	363
Depot (State Medical-Military), Organization of	257
DEVINE, WILLIAM H., Management of a Field Hospital.....	13, 97
Difficulties of a Volunteer Medical Officer, C. C. Foster	18
Dressings (First-Aid), in Military Surgery	15

E ARLY Surgical Interference in Appendicitis	230
Echinococcus-Hominis—A Remarkable Case, by Geo. W. Woods	14, 157
Effects of Bullets from Modern Rifles and Pistols, J. D. Griffith....	18
Engineers, Volunteer, Medical Officers	81
ENNO SANDER PRIZE ESSAY, Committee on.....	viii
Epidemic of Yellow Fever in 1897	282
Epithelioma of Tongue and Left Superior Maxilla Apparently Cured by Formalin, G. W. Woods	19, 216
ETHERIDGE, J. H., Memorial on.....	43
Executive Committee	v
Expedition to the Philippine Islands, H. Lippincott	168
F ARQUHAR, E. C., Memorial on	45
Field Hospital, Management of	13, 97
First-Aid Dressings in Military Surgery, N. Senn	15, 184
Flexion or Bent-Knee Marching, E. H. Bradford	175
Formalin, Apparent Cure of Case of Epithelioma of Tongue and Left Superior Maxilla by local and interstitial applications of	19, 216
FOSTER, C. C., Some of the Difficulties of a Volunteer Medical Officer when First Mustered into the United States Service..	18
G AIT of the Soldier, a Study of	15, 175
Gauze Treatment of Suppuration of Middle Ear	212
GIRARD, A. C., My Conversion from Conservatism to Early Surgical Interference in Appendicitis—A Sketch.....	18, 230
One of the Lessons of the Spanish War	18, 276
Girard's Paper, Committee on	viii
GORGAS, W. C., A Short Account of the Yellow Fever Epidemic of 1897, and More Particularly Its Relations to the Garrisons of the Regular Army Stationed in the Regions Affected....	282
GRANT, W. W., Remarks on First-Aid Dressing.....	16
GRIFFITH, J. D., Hospital Experience in the War with Spain.....	161
President's Address	8
Remarks of Retiring President	22
Some Further Effects of Bullets from Modern Rifles and Pistols	18
Gunshot Wounds in the Santiago Campaign, L. A. LaGarde.....	141

H AMILTON, J. B., Memorial on	45
HAVARD, V., Poison Ivy and Its Kindred—with Remarks on Other Skin-Poisoning Plants	203
HENDLEY, F. W., Some Observations of a Volunteer Medical Officer	272
Hernia, Operation for the Radical Cure of	13, 93
HOFF, JOHN VAN R., Some Steps in the Organization and Instruc- tion of the Medical Department of the Third Corps, U. S. V.	13, 106
Some Suggestions for the Organization and Interior Economy of a State Medical-Military, Sub-Depot in War Time	257
Honorary Members	362
Hospital Experience in War With Spain, J. D. Griffith	161
HUIDEKOPER, R. S., The Organization of the First Army Corps...	15
HUTTON, W. H. H., Memorial on.....	46
I LLUSTRATIONS, Military Hospitals	13
Hospital Ship "Relief"	14
Temporary Hospitals, etc., in Cuba and United States	14
Hospital Ship "Missouri"	14
X-ray Photograph and Photographs of Effects of Bullets..	14
Infantry, Territorial Medical Officers	81
Volunteer Medical Officers	82
Influence of the Climate of Whipple Barracks, Arizona, upon Pul- monary Tuberculosis, A. S. Porter	327
Instruction of Medical Department of Third Corps, U. S. V.....	106
J OHNSTON, Wm. M., The Medical Department of the National Guard Its Own Quartermaster	13, 139
L AGARDE, L. A., Remarks upon the Gunshot Wounds of the Reduced Caliber Rifles in the Santiago Campaign.....	15, 141
Lesson of the Spanish War, A. C. Girard.....	18, 276
Life Members	342
LIPPINCOTT, H., Some Reminiscences of the Expedition to the Philippine Islands	19, 168
Literary Committee	vi
M ACKINNON, Sir W. A., Memorial on	54
Management of a Field Hospital, William H. Devine	13, 97
Marching, Flexion or Bent-Knee	175
McELDERRY, H., Memorial on.....	48

McGEE, ANITA N., Women Nurses in the American Army.....	242
McWATTERS, WM., British Government.....	18
MEDICAL Department, Third Corps, U. S. V., Organization and	
Instruction of	106
Department of the National Guard Its Own Quartermaster,	
Wm. M. Johnston	13, 139
Military, Sub-Depot (State), Organization of	257
Officers, Army, Deaths Among	58
Officers, Volunteer, Army, Deaths Among	59
Officers, Volunteer, Navy, Deaths Among	59
Officers, Volunteer, Roster of	56
Officer (Volunteer), Some Observations of	272
Meeting, Minutes of	1
Members present at meeting	1
Active, elected	36
Associate, elected	36
by States or Service	365
Corresponding recommended	36
Honorary, recommended	37
Register of	342
Membership, Corresponding	21
Honorary	20
Middle Ear, Gauze Treatment of Suppuration of	19, 212
Military Surgery, Conservatism in	230
First-Aid Package in	134
Notes on Recent Progress	331
Past and Present, J. W. Trader	19
Minutes of the Meeting	1
MOLINA, Z. R., Practical Observations upon Yellow Fever or Black	
Vomit, Collected in the City of Vera Cruz	14, 290
MUNSON, EDWARD L., Tentage for Tropical Service.....	323
N ATIONAL Guard, Medical Department Its Own Quarter	
master	139
Medical Officers in Spanish-American War	60
National Guardsmen, Physical Standards of, J. F. Calef	13, 226
Necrological Report	43
Necrology Committee	vii
Notes on Recent Progress in Military Surgery, J. E. Pilcher	331
Nurses (Women) in the American Army	242

O BSERVATIONS of a Volunteer Medical Officer, F. W. Hendley	272
Observations on the Gauze Treatment of Suppuration of the Middle Ear During and Since the Spanish War, Charles M. Robertson	212
on the Santiago Campaign, L. A. LaGarde	15, 141
on Yellow Fever in Vera Cruz, Z. R. Molina	290
Officers and Committees, 1899-1900	v
Reports of	24
Officers from Organization of Association	339
Operation, for Radical Cure of Hernia	93
ORDWAY, A., Memorial on.....	49
Organization and Instruction of the Medical Department of the Third Corps, U. S. V., J. Van R. Hoff	13, 106
and Interior Economy of a State Medical-Military Sub-Depot, J. Van R. Hoff	257
of the First Army Corps, R. S. Huidekoper.....	15
P ATELLA, Wiring of Fractured	249
Philippine Islands, Reminiscences of Expedition to	19, 168
Physical Standards of National Guardsmen, J. F. Calef	13
PILCHER, JAMES E., Notes on Recent Progress in Military Surgery	15, 331
Resolutions regarding	21
Poison Ivy and Its Kindred, V. Havard	203
PORTER, ALEX S., The Influence of the Climate of Whipple Barracks, Arizona, upon Pulmonary Tuberculosis, as shown by Army Experience	327
Practical Observations upon Yellow Fever or Black Vomit, Collected in the City of Vera Cruz, Z. R. Molina	14
President's Address	8
Publication Committee	vii
Q UARTERMASTER, Medical Department of the National Guard Its Own	139
R EDUCED Caliber Rifles, Gunshot Wounds of, in the Santiago Campaign	141
REED, W., Sterilization of Water for Troops in the Field, with Description of Apparatus	148
Register of Members	342

Remarkable Case of Echinococcus Hominis, G. W. Woods	14
Reminiscences of the Expedition to the Philippine Islands. H. Lippincott	19
Reports of Officers and Committees	11, 24
Resolutions of thanks	22
RICHARD, CHARLES. The Army Hospital Train during the Spanish-American War	18, 196
ROBERTSON, CHARLES M., Some Observations on the Gauze Treatment of Suppuration of the Middle Ear, During and Since the Spanish War	19, 212
ROHE, G. H., Memorial on.....	51
Roster of Volunteer Medical Officers in Spanish-American War, C. H. Alden	56
S ANDER, ENNO, Prize Medal	17
Santiago Campaign, Gunshot Wounds in.....	141
Some Observations on	15
SCHAUFFLER, DR. E. W., for Medical Profession of Missouri.....	4
Secretary, Report of	11
and Editor, Report of	24
SENN, N., Announcement of 'Enno Sander' Medal.....	17
SENN N., First-Aid Package in Military Surgery.....	15, 184
Skin-Poisoning Plants	203
SMITH, L. S., Memorial on.....	52
Some Recent Military Surgical Literature. J. E. Pilcher.....	15
Some Steps in the Organization of the Medical Department of the Third Army Corps, U. S. V., John Van R. Hoff	13
Spain, Hospital Experience in War with	161
Spanish-American War, Army Hospital Train during	196
Spanish War, One of the Lessons of	18, 276
Special Committees	vii
Standards, Physical, of National Guardsmen	226
Standing Committees	vi
State Medical-Military Sub-Depot Organization of	257
Sterilization of Water for Troops in the Field, W. Reed	148
STERNBERG, GEO. M., Letter.....	9
STRANGE, F. W., Memorial on.....	53
Study of the Gait of the Soldier, E. H. Bradford	15
Surgery (Military), Conservatism in	250

T ENTAGE for Tropical Service, Munson, E. L.....	323
Third Corps, U. S. V., Organization and Instruction of Medi- cal Department of	106
TRADER, J. W., Military Surgery, Past and Present.....	19
Transportation Committee	vii
Treasurer, Report of	11, 24
Tropical Service, Tentage for	323
Tuberculosis, Pulmonary, Influence of the Climate of Whipple Bar- racks, Arizona, upon	327
V ERA Cruz, Yellow Fever in	290
Volunteer Medical Officer, Some Observations of	272
Volunteer Medical Officers in the Spanish-American War, C. H. Alden	12
Medical Officers, Roster of	56
W ARNER, Maj. Wm, The American Volunteer	5
Waterhouse-Forbes Water Sterilizer	150
Wiring of Fractured Patella, G. W. Woods	249
Women Nurses in the American Army, Anita N. McGee	242
WOODS, GEO. W., Capt., for U. S. Navy.....	3
Bassini's Operation for the Radical Cure of Hernia	13, 93
Epithelioma of the Tongue and Left Superior Maxilla Appar- ently Cured by Applications of Formaldehyde, Locally and Interstitially	19, 216
Echinococcus-Hominis—A Remarkable Case of Echinococcus, Manifested First in Chest Wall and Subsequently in Osseous Tissue of Left Humerus	14, 157
Wiring of Fractured Patella	249
Y ELLOW Fever Epidemic of 1897, W. C. Gorgas	282
in Vera Cruz	14, 290

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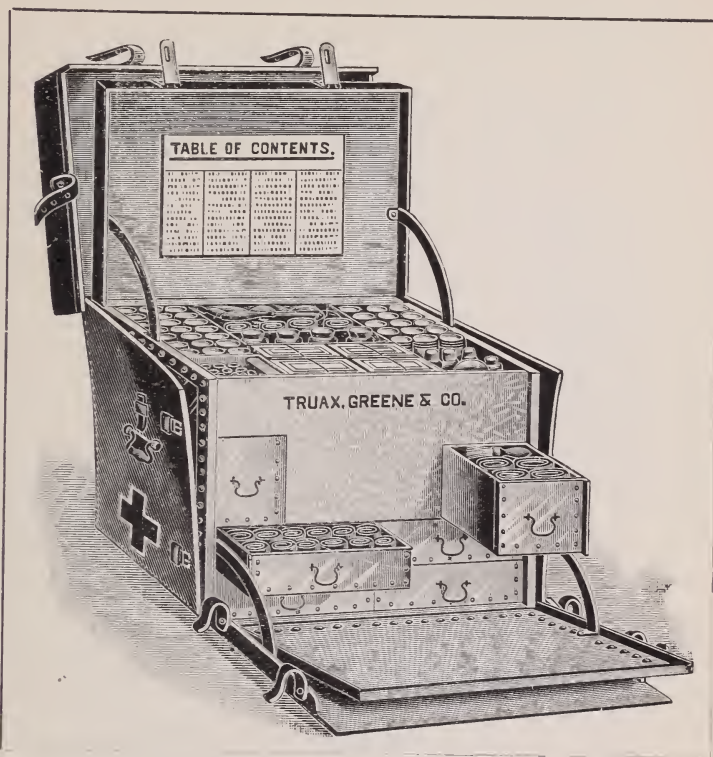
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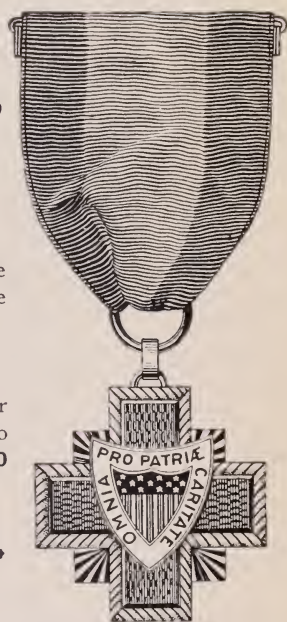
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